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IRON TRADE REVIEW

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CLEVELAND, O., APRIL 26, 1928

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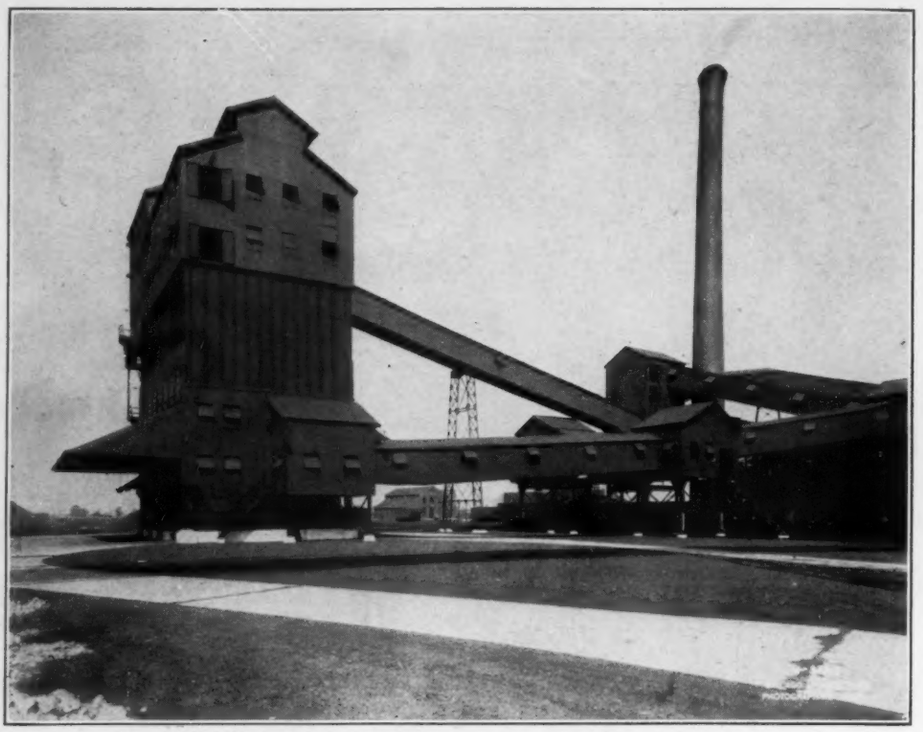
DESIGNERS AND BUILDERS OF ROLLING MILL MACHINERY

Dependable Handling of Materials



DOMESTIC COKE SCREENING STATION AND COKE CONVEYORS
CHICAGO BY-PRODUCT COKE COMPANY

THIS view shows an important part of the material handling plant built for the Chicago By-Product Company by the Koppers Construction Company. Five sizes of domestic coke are prepared in this screening station to meet the requirements of a critical market.

The wide experience of a special department of the Koppers Construction Company in designing and building dependable coal and coke handling equipment for by-product coke plants, gas plants and central power stations, is available for the solution of material handling problems.

The Koppers Construction Company

Designers and Builders of
BY-PRODUCT COKE AND GAS PLANTS

Chicago Pittsburgh New York

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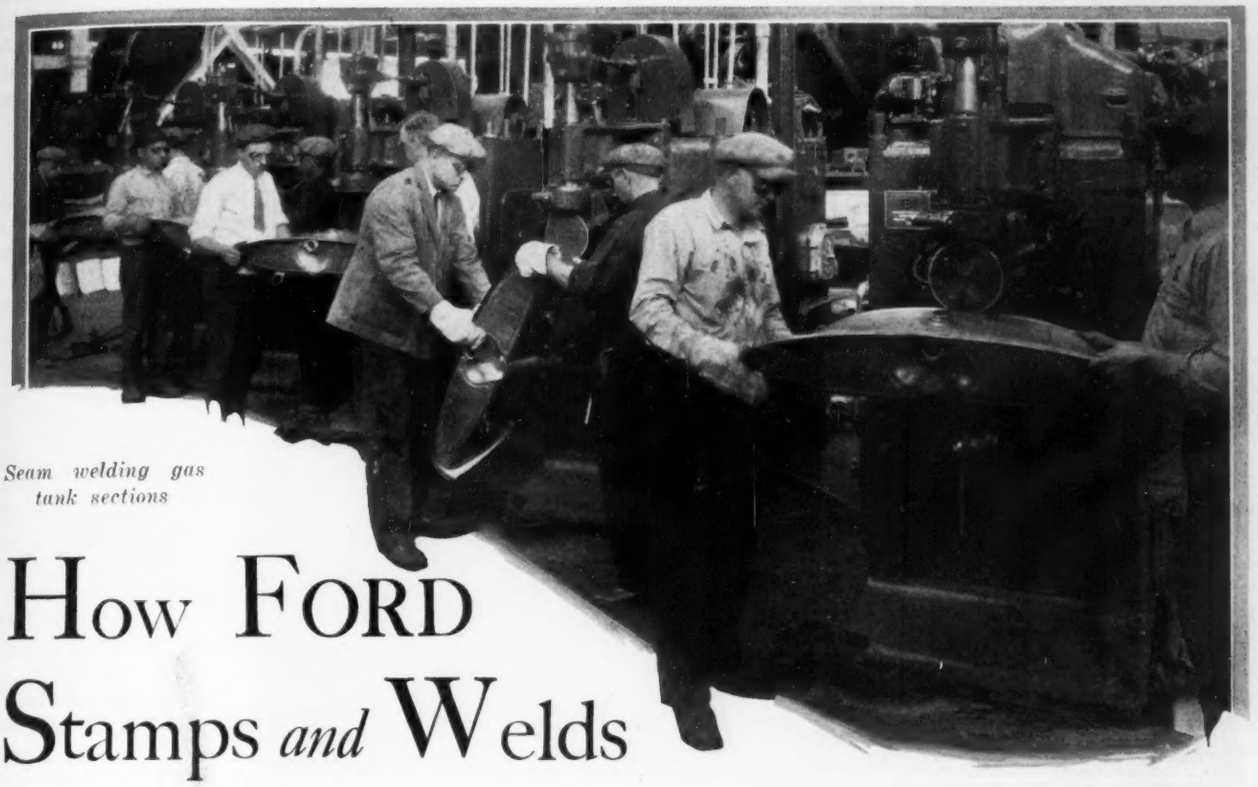


Seam welding gas tank sections

How FORD Stamps *and* Welds

PARTS for FAN and GAS TANK

Forming of Fuel Tank from Terne Plate Involves 54 Operations—Fan Pulley Probably Is First Precision Welding Job

By John D. Knox

STEEL is the most widely used material in the present model Ford car, fabrication and assembly of many parts being accomplished by electric welding. For the joining of certain parts, such as the spring perch to the brake flange of the rear axle housing, the flash resistance method is employed; for closing the gap in the rear axle tubular section, the arc welding process is used. The fabrication of these parts was described in a recent issue. Seam welding was adopted by the Ford company for the assembly of the gas tank and fan blade members after tests to destruction demonstrated the strength afforded by this method of joining.

A seam weld is a method of spotwelding, each spot overlapping its predecessor so that the union is continuous. Low-voltage, high-amperage current is led from the transformers to the electrodes by heavy flexible copper leads; but, instead of the current reaching the work through copper clamping jaws, such as are used in the machine for welding various parts in the rear axle assembly, as described in a recent article, the electrodes are rotating copper disks mounted vertically, one above the other. As the work passes between the electrodes at a uniform rate of speed, the current flows from one disk to the other through the steel causing it to become heated to a suitable temperature. At the same time the pressure exerted by the disks causes the members to fuse together along the length of the seam. Ap-

FOURTH of a series of articles on stamping, forging and welding processes employed by Ford Motor Co. in producing its Model A car. The first appeared in the March 22 issue; second April 5, and third April 12.

proximately 54 separate operations are involved in the fabrication of the fuel tank, which is made in two sections, namely, the top and bottom, from 18-gage terne plate. Ordinary steel is not suitable for this particular part; copper is too costly and cannot be welded as readily as the lead and tin coated sheet. In making the bottom section of the gas tank, the terne plate as received from the manufacturer is blanked in a motor-driven press to an irregular shape. The blank then is subjected to two forming operations, trimmed and restruck. This leaves the blank with its two ends turned upwards, one to serve as the instrument panel and the other to face the engine. The center of the instrument panel then is embossed, the relief being on the interior. A notch is made for the hood rod and this operation is followed by again embossing the instrument panel.

To provide a suitable surface for joining with the top section later, the ends of the bottom tank section are flanged upwards. Then follows in sequence the piercing, restriking and embossing of the gasoline outlet hole; and, the piercing of a hole for the gasoline outlet bracket, steering-shaft housing and choke rod brackets. The section is washed to remove all foreign material that collects on the surface during the forming operation and then is inspected.

Meanwhile the support for the ignition cable, the outlet casting for the gasoline, the steering rod bracket and splash plate reinforcing, and, the choke rod are assembled. After spinning the flange on the gasoline gage bracket and assembling the gasoline gage casting, the splash plate is spot welded to its reinforcement, and this in turn soldered to the bottom section of the tank. A final wash and inspection completes the operation involved in the fabrication of this particular section.

In making the top section of the gasoline tank, the terne plate is blanked, subjected to two forming operations and trimmed to the required side dimensions. The filler hole for the gasoline then is embossed. One end next is trimmed and the operation repeated on the opposite end. The section is restruck and if inspection discloses no defects, the end pillar casting is soldered in place. After all foreign material is removed by washing, the piece is ready to be joined to the bottom section.

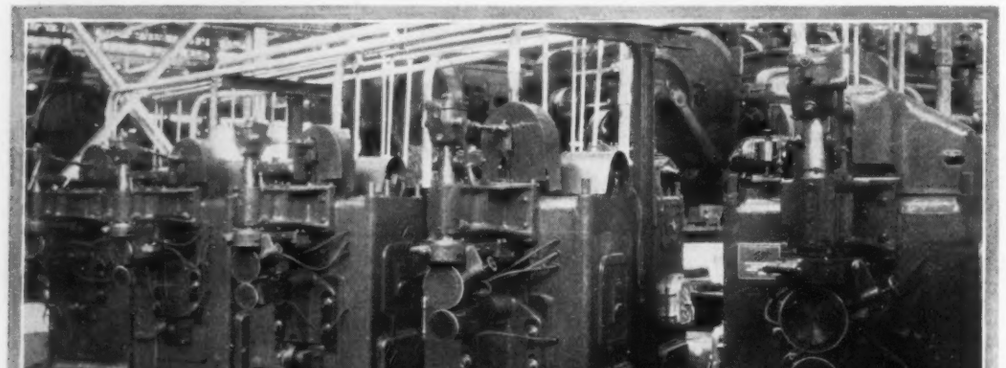
Assembly Is Restruck

With the top section aligned on the bottom section between a die and a punch in a forming press, the whole is restruck to true form. Quick-acting clamps are applied to hold the assembly together until the flanges can be spotwelded for convenience in the following operations. The joints of the two sections then are welded together by the seam welding process.

Each welding machine is gaited to seam weld at the rate of 38 lineal inches a minute, 100 tanks per man per day being completed at present. The units are of special Ford design and are equipped with 150 kilovolt-ampere transformers. The shafts on which the electrode disks are mounted, must carry the loads of the welding pressure and since they must rotate freely, a lubricant must be provided. The lubricant employed is mercury which is a good conductor and permits the passage of the welding current from the transformer leads of the machine to the welding dies.

Upon completion of the seam-welding operation, the tank is submerged in water while connected with an air line carrying 12 pounds per square inch pressure. Air bubbles rising through the water will disclose any leakage. The tank then is flanged and one end restruck. After a hole is pierced for attaching the assembly to the lower side panel, the opposite end is restruck to impart the final shape. Holes next are pierced to permit assembly to the cross rails and the container then is inspected. An assembled dash then is spotwelded to the tank and after a bracket for the hood is attached by spotwelding, the entire unit is polished and a second water test identical to that previously mentioned follows. After a final inspection the tank is routed to the main assembly station for installation in the Model A car.

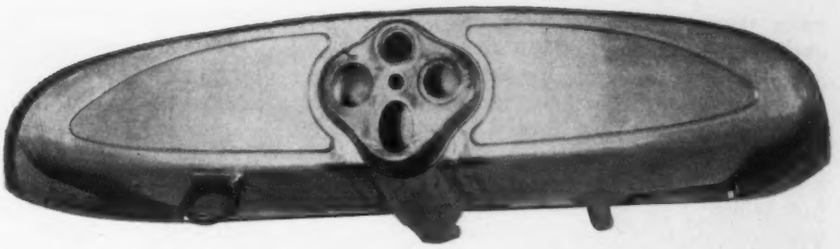
Seam welding also is used in building up the two-bladed fan assembly. Starting with a blank, the steel is notched and then subjected to two forming operations which bend the side edges through a short arc of a circle. The piece is restruck, trimmed and embossed at the center. Two of these members then are placed together in a reversed position to give it the shape of an airplane propeller. The member then is transferred to a spotwelding machine and tacked in



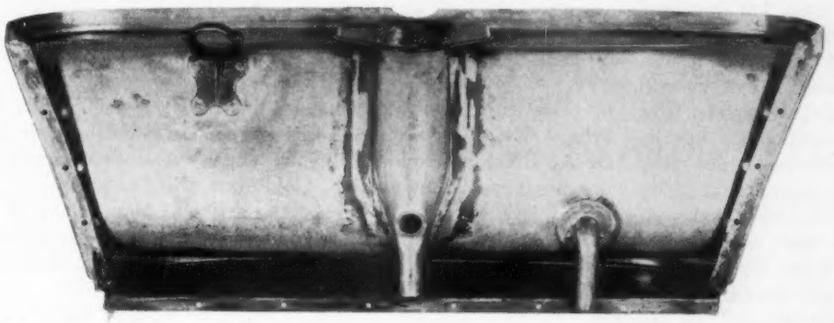
MACHINES employed for seam welding the gasoline tank assembly. Each is gaited to weld at the rate of 38 lineal inches a minute

about six places merely to secure rigidity during process of manufacture. The section is restruck in a forming press to uniform contour and then is passed to the seam welding machine where the sides and ends are joined together making a single member. This is executed as follows:

One side of the fan blade is seam welded along the edge and the operation then is repeated on the opposite side, separate machines being employed. The electrodes in the seam welders are copper disks, those used for welding the sides being mounted horizontally in the same plane and those for welding the ends being mounted one above the other in a vertical position. The disk-type electrodes for performing the welding on the sides of the blade have a section at the periphery cut away. The open areas of both disks come opposite each other once in every revolution. This construction permits the edge of a blade to be inserted between as the disks revolve. The moment the true diameter of the disks closes the gap, the fan blade at the seam is put under pressure and is made to travel towards the rear of the table. Meanwhile current passes from one disk to the other, a welding heat being generated as a result of the resistance of the metal to the flow of current. One revolution of the disks brings the cut-away section opposite each other thus facilitating easy removal of the blade upon completion of the weld. The welder is designed with a switch geared and synchronized with the copper welding disks so that the weld starts and terminates at the proper place on the fan blade.



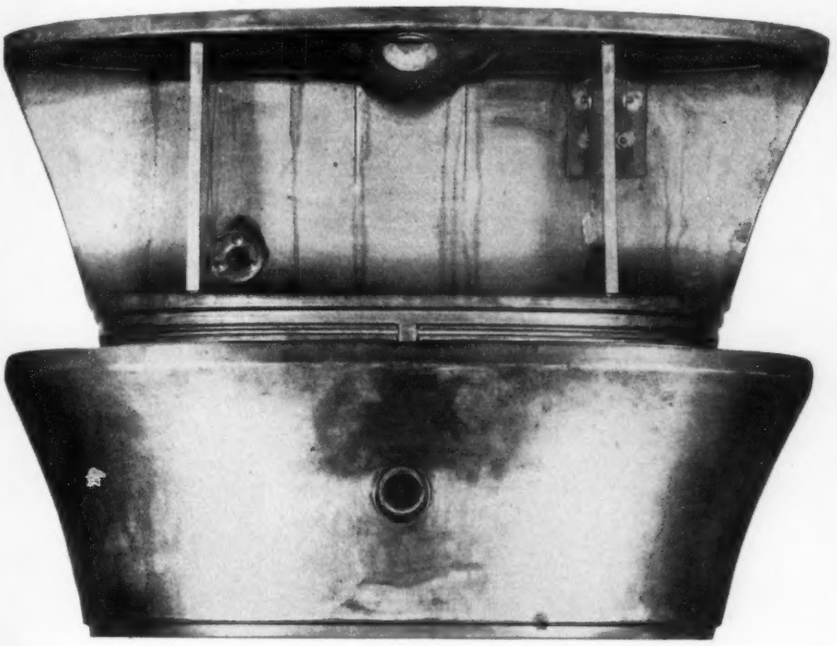
Front of the seam welded gasoline tank which serves as the instrument panel



Exterior of the lower section of the gas tank showing the position of the steering column brace

The highly specialized horizontal machines for seam welding the fan blades were developed by the Ford organization. Each is equipped with a 50-kilovolt-ampere transformer arranged for 440-volt, 60-cycle current.

Upon completion of the welding operations along the edges, the fan blade is seam welded at both ends. The electrodes are disks mounted vertically one above the other, operation being similar to that employed for seam welding the gas tanks as previously explained. The roughness along the side of the blade is removed by grinding, the member is brought to true form by restriking in a forming press and the center is perforated to take the pulley assembly. Then follows a straightening operation, trimming of the ends, filing of burrs and polishing, and inspection. A pulley assembly then is installed in the fan blade and after being clamped in place spotwelding is employed to make the union of the two members permanent. The completed assembly is inspected for any defects, dynamically balanced and finally painted; it then is ready for installation.



Top and bottom sections of gas tank as they appear before being registered for welding

Comprises Three Parts

The fan pulley is of unique design in three pieces, and is said to be the first precision welding job ever put on production. The maximum allowable runout is 0.005-inch which means that the misalignment at the weld cannot exceed 0.0025-inch. As a matter of fact, it is less than this figure because the point of indication is such that it tends to multiply any error in alignment. This is phenomenal when considering the coefficient of expansion in steel and the welding temperature employed. The coefficient is 0.00000636-inch per degree of heat Fahr. and the welding temperature 2400 degrees Fahr. The expansion and contraction due to heat is extremely difficult to control because all strains in the steel due to rolling, machining or welding immediately will

make themselves known in the production of precision welded articles.

The hub is made from bar stock on an automatic screw machine; the body is blanked, drawn and formed from sheet steel. They are clamped in a special Ford designed machine and flashwelded. The assembly then is taper reamed to finished size and the rim clamped in place and spotwelded. The development of this precision job by engineers of the Ford company is one of the milestones along the road of welding achievement.

Problems confronting engineers of the Ford company in building the Model A car were presented in the first article of this series which appeared in the March 22 issue. How steel is forged, spun and welded into parts for the rear axle housing was described in detail in two additional articles in the April 5 and 12 issues. The fifth article in an early issue will describe how special shaped bars rolled on the merchant mills of the company are fabricated into the starter gears and differential ring gears of the Model A truck and passenger cars. The raw material is heated in a novel type electric furnace which has many features. Numerous operating details will be included in the final article.

PROGRESS in automobile manufacture and advancement in building good roads are related. While Iron Trade Review has been systematically describing unique welding, forging and stamping processes used by Ford Motor Co. in production of its new motorcars, this publication also has been preparing its annual survey of roadbuilding activities in the United States, to show the amount of steel going into roadwork. The Ford article in this issue is the fourth of a series which began March 22. The article on roadbuilding, on the following pages, represents the fifth annual study of the subject by Iron Trade Review.

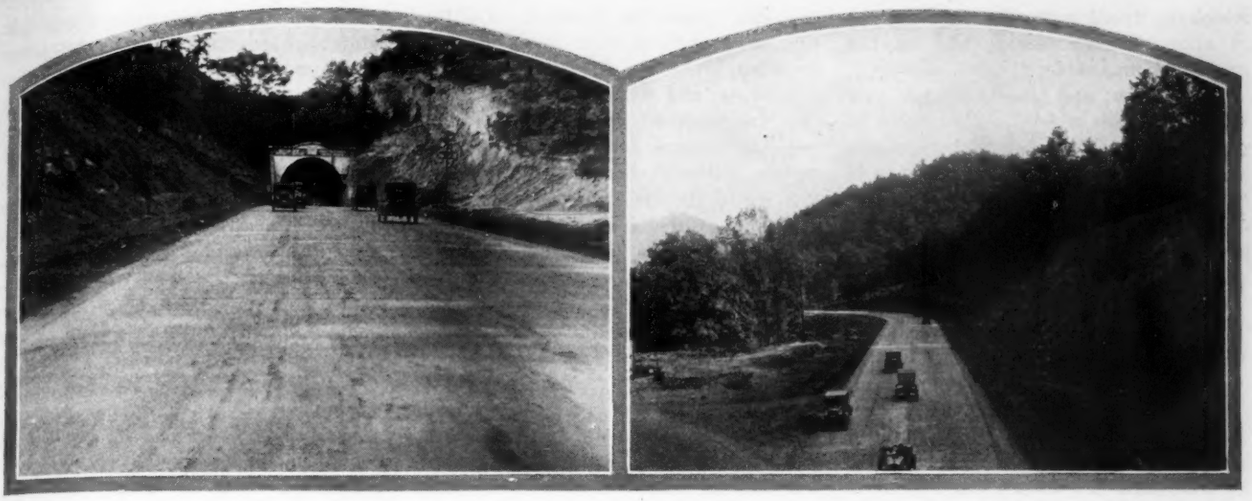
"Some Refractories Which Are in a Development Stage," is the title of technologic paper No. 5 just issued by the American Refractories institute, Oliver building, Pittsburgh. G. A. Bole, research professor, engineering experiment station, Ohio State university, Columbus, O., is the author. Copies may be secured from the institute headquarters for 50 cents each.

Rail Tests Published

Results of a co-operative investigation by the Manufacturers' Rail Steel committee and the joint committee on stresses in track of the American Railway Engineering society and the American Society of Civil Engineers in the study of rail failures with particular reference to transverse fissure failures have been published by the bureau of standards, Washington, recently.

Plans have been made, after sections have been removed from track, to redetermine the endurance limits of specimens from the heats now under observation by engineers of the bureau of standards.

Partial view of the station where the airplane-type fan blade is seam welded along the sides and ends to make a single member



Cherokee trail and Dixie highway, Hamilton county, Tenn., a concrete highway of 36-foot width

Highways To Take More Steel in 1928

State Road Programs for Current Year Involve Heavier Expenditures—Tendency Toward Lighter Steel Requirements in Specifications Offset by Greater Volume of Work

By R. T. Mason

SPRING months bring into full swing again one of America's greatest industries, roadbuilding. This industry has grown from a position of secondary importance several decades ago, roadwork expenditures having totaled but $60,000,000 in 1904, to one of major rank, involving annual disbursements of between one and two billions. Expenditures in 1927 for roadwork are estimated to have approximated $1,500,000,000, with a greater total probable for 1928.

Estimates of highway construction contemplated for 1928 building by state commissions, presented here in the fifth annual survey of such programs by IRON TRADE REVIEW, reveals that more than a half billion will be spent during the current year. Approximated totals for 38 states reporting indicate a total expected expenditure of $513,525,428.46 for 1928. Inasmuch as a large proportion of highway work is carried on by counties with state or federal aid, the total would be more than doubled. Thirty-seven states reported an expenditure of $443,270,515.88 in the fourth annual survey by IRON TRADE REVIEW, indicating a greater program for the present year.

The building of hard surface roads, a necessary adjunct to the increased use of pleasure and commercial automotive vehicles continues to fall short of public demands. The bureau of public roads has estimated that there are in existence about 270,000 miles of state highways and 3,000,000 miles of rural roads. As only approximately 50,000 miles has been constructed of concrete, the scope of the field available to concrete paving is almost unlimited.

Of 16,639.37 miles of highways to be constructed during 1928, as reported by 38 states, 3696 miles is contemplated for concrete. This program is estimated to require 66,469 tons of reinforcing steel bars. As such important highway commissions as Illinois, Michigan, and New Jersey have not estimated steel requirements for 1928, the total is not as large as actual demands should materialize. New Jersey's program includes 135 miles of concrete highway of a total of 145 miles. New Jersey uses a heavy type of reinforcement that should require from 6000 to 10,000 tons of steel. Michigan's enlarged program will take a similar amount while Illinois, whose reinforcement specifications have been adopted as standard by several other states, should require over 20,000 tons of steel. Total state needs consequently may be estimated at 125,000 to 150,000 tons.

Defense highway, Anne Arundel county, Maryland

Including county and municipal highway construction, 1928 steel needs will exceed 250,000 tons. In addition, 24 states have listed separately their requirements for culverts, bridges and similar highway appurtenances as involving 39,555 tons for 1928. This tonnage includes both reinforcing bar and structural steel requirements. One of the largest programs for bridge-building, although not involving a heavy tonnage in the aggregate, is that contemplated by New Hampshire,

which is faced with the replacement of approximately 100 bridges washed out or damaged by floods.

New York and Pennsylvania continue the leaders among the states in construction of reinforced concrete highways. Estimated requirements of New York for 1928 are 25,900 tons for roadwork and 8200 tons for culverts and bridges. Pennsylvania will require about 15,600 tons of concrete bars and steel mesh for roadbuilding.

The advantages of concrete highway construction are spreading to the South, where South Carolina assumes leadership in reinforced concrete roadwork. Approximately 5000 tons of reinforcing steel bars will be required by that state in constructing 200 miles of concrete roads on its 1928 program. Changes in specifications were made by a number of states for 1928 construction. Alabama has required that concrete pouring aggregates be measured by weight and that a longitudinal center joint and tie bars across the long joints be included. California has required that steel bars be included.

Georgia and Tennessee have specified use of steel mesh at 44 pounds per 100 square feet, to be laid two inches below surface. North Dakota has made the use of bars and mesh optional as designated on engineer's plans. Iowa has adopted a 43 to 44-pound weight per 100 square feet for use of steel mesh and Ohio now requires that reinforcing be laid two inches from the surface instead of optional on plans.

District of Columbia has made minor changes in construction details. Florida has altered its specifications but has not issued them as yet. Kansas also has revisions of design under preparation, as has Maryland, New Jersey, New Mexico, North Carolina, Pennsylvania, South Carolina, Tennessee, Wisconsin and Wyoming. Several other states are altering requirements for gravel or macadam.

The most marked developments in reinforced concrete road construction is in increasing width of surface. Narrow roadways as a factor in hazards of transportation have become a handicap to vehicular travel, and most new roads are being constructed of sufficient width to increase safety. Many highways are being augmented with a shoulder or collar to increase width.

Adoption by the department of commerce, government agency in supervision of national highways, of a unified system of roads, has aided in fostering construction. A few of the continuous highways include route 1, from Maine to Florida; route 20, from Boston to Yellowstone National park, Wyoming; route 31, from Mackinaw, in northern Michigan to Mobile, Ala., and route 81, from the Canadian boundary of North Dakota, to the Mexican boundary of Texas.

Shortening of routes between principal cities also has been a factor in road construction, one such case be-

State Highway Programs for 1928

States	Miles to be built	Miles of concrete	Miles of resurfacing	Tonnage of steel for roads, culverts, etc.		Type of reinforcing	Amount of federal aid in state annually or for 1927	Approximate expense of 1928 program	Revenue from gas tax in 1927
Alabama	1,205	200	.....	.....	.....	.....	$1,547,220	$12,000,000	$1,854,279†
Arizona	Program not yet completed				2,000	.....	.....	.....	.....
Arkansas	Program not yet completed					Bars	.....	.....	3,121,118
California	510	144††	Program not completed		Bars and mesh		2,483,437	25,000,000	19,640,948
Colorado	200 to 300	None	Not known.	Reinforced concrete not used			1,400,000	5,000,000	2,710,000**
Connecticut*	120.29	Not known		Not known		Bars and mesh	567,024	10,962,310	9,014,003*†
Delaware	Not known	None	None	None	160	Bars	365,000	1,800,000	485,000
Dist. of Col.	No reinforcing steel used in roadbuilding						.....	.....	.....
Florida	Not known	None	.....	None	1,000	Bars and mesh	899,451	14,000,000	10,710,434
Georgia	630	Program not definite						2,400,000	6,143,056
Idaho	240	None	360	3	400	Bars	936,000	3,681,000	1,700,000
Illinois	Program not yet completed						.....	.....	.....
Indiana	225-250	Reports not available through state highway commission of detailed program							.....
Iowa	625	625	None	9560	Not known	Bars	2,000,000	28,500,000	1,833,000
Kansas	1450	80	.....	325	.....	.....	.....	8,000,000	4,623,700
Kentucky	600	75	150	700	2600	Bars	1,420,000	15,000,000	6,000,000
Louisiana	Program not yet completed						.....	.....	2,823,108
Maine	90	10 Included in building		700	Not known	Bars	700,000	2,400,000	Not stated
Maryland	125	None	.....	.....	100	Bars	635,000	8,700,300	4,100,000
Massachusetts	250	2u Included in building		1200	300	Bars	1,000,000	12,000,000	No gas tax
Michigan	Program not yet completed					Mesh	.....	.....	.....
Minnesota	Program not yet completed						.....	.....	.....
Mississippi	365	60	50	1120	7500	Bars and mesh	1,300,000	2,800,000	4,272,592
Missouri	722	112	None	1456	2400	Bars	2,400,000	14,000,000	5,842,130
Montana	Program not yet completed						.....	.....	.....
Nebraska	400	0.2	Gravel 200	5	600	Bars	1,600,000	4,000,000	3,500,000
Nevada	85	None	None	None	100	Bars	957,995	1,138,118	460,000
New Hampshire	125	30	50	1200	600	.....	365,000	7,500,000	1,210,267
New Jersey	145	135	.....	.....	.....	Bars and mesh	960,000	30,000,000	3,378,552†*
New Mexico	210	6	Not known	None	900	Mesh	1,730,000	2,750,000	.....
New York	660	540***	2300	25,900	8200	Optional	3,635,000	55,000,000	No gas tax
North Carolina	900	None	.....	.....	3000	.....	.....	15,000,000	7,865,088
North Dakota	460	100	850	.....	500	Bars	1,193,000	3,500,000	1,200,000
Ohio	350	200	100	Not known	Not known	Bars and mesh	2,800,000	34,000,000	13,000,000
Oklahoma	560	110	.....	.....	.....	.....	.....	13,000,000	6,392,752
Oregon	100	None	80	None	3300	Bars and mesh	800,000	3,000,000	3,600,000
Pennsylvania	900	600	150	15,600	Not known	Bars and mesh	3,500,000	43,000,000	17,296,333
Rhode Island	40	14	480	430	.....	Mesh	500,000	3,500,000	1,100,000
South Carolina	500	200	Not known	5000	1000	Bars	1,059,533	18,000,000	5,000,000
South Dakota	400	9	300	200	1275	Bars and shapes	1,200,000	4,000,000	2,300,000
Tennessee	500	Not known	Not known	.....	.....	.....	1,600,000	20,000,000	4,000,000
Texas	Program not yet completed						.....	.....	11,951,106
Utah	150	8	40	600	.....	Mesh	1,000,000	3,000,000	1,447,137
Vermont	440	38	Not known	1435	170	Bars	365,625	1,900,000	.....
Virginia	Not known	None	Not known	750	750	Bars	1,450,000	8,994,000	6,245,036
Washington	298	70	150	250	1200	Bars	1,143,226	12,000,000	3,803,698
West Virginia	80	10	Not known	650	1000	Bars and mesh	793,000	5,500,000	3,676,371
Wisconsin	1454.8	299.98	Not known	Not known	Not known	Bars	1,875,000	34,000,000	5,000,000
Wyoming	400	None	2850†††	85	500	Bars	960,000	2,900,000	756,048
Totals	16,639.37	3,696	8,110	66,469	39,555	.....	$47,140,511	$513,525,428	$188,055,763

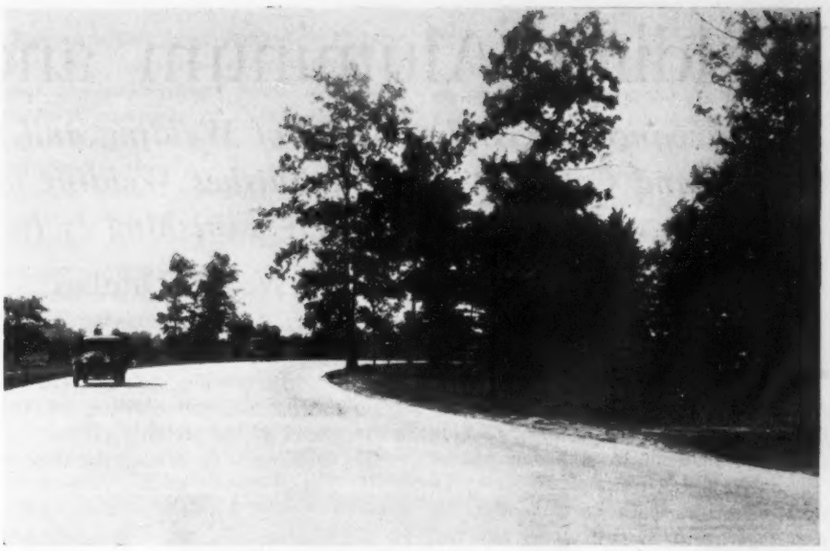
*Connecticut does not forecast its construction programs. Data is for fiscal year of 1927.
† 7 months.
†† Paved, unknown portion to be concrete.
** Estimated for 1928
*† For four years.
†* Six months.
*** 1927
††† Maintained.

ing the elimination of 240 miles on trunk highways of Minnesota, by relocation of routes, easing of curves and elimination of turns. Eight routes in that state were shortened by ten miles or more in 1927.

The building of superhighways also has received marked stimulus in districts of dense population. Wayne county, Michigan has become noted throughout the Middle West for its 40-foot highways and its network of concrete roads radiating from Detroit and circling it at mile intervals. Illinois in the past year has been constructing super-highways, one being a 40-foot pavement of 60 miles length from Chicago to Kankakee, Ill., which is scheduled for completion during 1928.

Finding that income from gasoline taxes, license fees and federal aid is not sufficient to proceed at the desired rate, a number of states are laying out roadbuilding programs for several years in the future, funds for which are to be obtained by bond issue. One of the most notable of recent programs undertaken is that in Iowa where a special session of the legislature was convened this spring to consider the floating of a $100,000,000 bond issue for taking over present county issues and financing a state wide program.

Mississippi also is planning for future construction, a bill being pending in the state legislature for a $60,000,000 bond issue. Vermont also has a bond issue for roadwork of $8,000,000, and voters of West Virginia will ballot on a $35,000,000 bond issue in November elections. In 1927 the state legislature of Wyoming provided an income for completing the highway system of the state in ten years. Missouri, however, has discontinued the issuance of bonds and now operates on the "pay-as-we-go" plan.



Michigan has been a leader in developing wide roads, the above being a 40-foot highway, River Rouge Park drive, Wayne county, Michigan

Concrete Mileage Completed to Jan. 1, 1928

State	Total highway mileage	Federal aid system mileage	Miles built to Jan. 1, 1928: Concrete roads 18 ft. wide Built 1927	Jan. 1, 1928	Concrete streets based on 30 ft. wide	Concrete alleys based on 18 ft. wide
Alabama	56,551	3,884.00	69.2	204.3	270.5	36.1
Arizona	21,400	1,498.00	1.3	436.6	21.5	3.8
Arkansas	71,960	5,021.13	18.6	253.6	234.8	5.2
California	70,000	4,771.50	295.4	4,136.7	2,143.5	116.8
Colorado	48,000	3,332.00	25.6	265.8	76.5	177.8
Connecticut	12,000	835.43	91.0	512.3	103.2	0.1
Delaware	3,800	415.81	35.1	506.1	10.5	.....
Dist. of Col.	.....	.....	2.5	11.6	87.1	42.1
Florida	27,548	1,926.00	118.6	417.2	253.2	52.9
Georgia	80,892	5,560.40	197.4	772.0	413.5	8.9
Idaho	40,200	2,770.00	0.4	51.9	21.6	1.4
Illinois	96,771	6,616.78	600.5	6,064.0	1,644.1	814.7
Indiana	70,946	4,701.50	394.5	2,599.2	465.2	129.4
Iowa	109,113	7,212.00	321.3	1,020.9	837.8	110.3
Kansas	124,143	7,922.00	133.8	711.4	232.5	49.8
Kentucky	53,000	3,702.45	62.1	333.8	130.4	48.6
Louisiana	40,000	2,712.90	15.8	61.1	82.4	27.6
Maine	23,104	1,393.46	21.2	118.2	27.6	0.5
Maryland	14,810	1,503.72	106.3	1,294.0	115.3	138.1
Massachusetts	20,525	1,308.00	19.3	332.1	166.3	1.9
Michigan	75,000	5,235.00	569.7	3,420.4	642.1	424.2
Minnesota	103,050	6,849.60	125.0	918.1	291.0	63.8
Mississippi	53,000	3,604.00	38.8	313.8	80.8	17.2
Missouri	111,510	7,530.00	192.0	1,531.9	644.3	104.4
Montana	67,100	4,665.00	1.5	28.5	40.6	7.1
Nebraska	80,272	5,576.55	9.3	118.7	132.7	33.9
Nevada	22,000	1,398.00	3.8	42.2	9.8	2.0
New Hampshire	14,112	980.91	9.0	29.6	13.5	0.5
New Jersey	17,120	1,179.80	189.9	1,140.7	637.5	7.5
New Mexico	47,607	3,298.00	8.3	89.2	38.9	2.9
New York	81,873	5,451.00	751.5	4,714.9	915.6	10.9
North Carolina	60,000	3,860.80	386.9	2,026.4	234.2	10.3
North Dakota	106.202	7,194.00	.....	7.4	41.2	5.0
Ohio	84,497	5,899.30	216.0	2,369.9	510.3	93.0
Oklahoma	112,698	5,528.00	170.3	868.2	390.5	25.0
Oregon	41,826	2,840.50	20.2	292.5	298.3	12.3
Pennsylvania	90,000	4,871.22	448.6	4,350.7	512.3	77.9
Rhode Island	2,368	356.86	16.3	102.1	7.9	0.05
South Carolina	52,318	3,230.00	167.2	400.0	55.2	4.5
South Dakota	115,390	5,767.00	.....	2.8	116.5	6.1
Tennessee	65,204	3,252.80	87.3	424.2	162.3	22.1
Texas	182,816	11,685.00	242.3	931.7	349.9	37.2
Utah	24,057	1,677.33	10.7	252.3	61.5	4.1
Vermont	14,900	1,043.00	25.6	66.7	28.4	0.16
Virginia	53,338	3,233.00	116.2	914.9	111.2	6.9
Washington	42,428	2,927.50	91.9	1,265.6	613.9	40.1
West Virginia	31,629	2,048.31	97.0	831.6	125.1	16.3
Wisconsin	78,800	5,493.36	392.6	2,675.1	770.2	199.4
Wyoming	46,320	3,097.00	0.07	13.1	24.6	1.7
Total	2,861,198	186,859.92	6,917.87	50,246.0	15,197.7	3,002.4

Data compiled by Portland Cement association.

By-Product Percentage of Coke Higher

Preliminary figures of the federal bureau of mines show that by-product coke ovens accounted for 86.2 per cent of the total output of coke in 1927, against 78 per cent in 1926 and 77.8 per cent in 1925. By-product coke plants associated with blast furnaces produced 34,065,000 tons in 1927 compared with 9,856,000 tons for all other plants. By states, Pennsylvania led by-product production in 1927 with 11,329,000 tons. Ohio was second with 7,129,000 tons, Indiana third with 5,499,000 tons and Alabama fourth with 4,330,000 tons.

General Electric Net Up

General Electric Co. sales billed in the first quarter of 1928 totaled $71,640,790, compared with $72,474,474 a year ago, according to Gerard Swope, president. Net income from sales was $8,235,982 this year and $8,833,173 last. Profit available for dividends in the first quarter this year totaled $11,261,842, against $11,028,143 a year ago.

Welding Aluminum and Its Alloys

Allowance for Higher Speed of Welding and for Greater Expansion and Contraction Distinguishes Welding of Aluminum from That of Steel—Finishing Is Important

By W. M. Dunlap

ALUMINUM is coated with a thin film of aluminum oxide which prevents the easy coalescing of the two surfaces of molten metal. The production of a sound weld in aluminum necessitates the removal of this oxide film. The most effective method of removing it is by the use of a flux which has the ability to dissolve the aluminum oxide so that coalescence may occur. A satisfactory flux for the welding of aluminum must have the following characteristics:

1. It must melt at a suitable temperature below the melting point of aluminum.
2. When molten, it must have the ability to dissolve aluminum oxide and do it quickly.
3. The dissolving capacity of the flux must be sufficient to take care of all of the oxide present.
4. The molten flux, with the oxide dissolved in it, must have a specific gravity less than that of the molten aluminum and the difference must be sufficient so that the flux will quickly and readily come to the surface of the molten metal, thus removing the oxide from the weld.
5. The flux must be stable under the temperatures used for welding aluminum.
6. It must not deteriorate with time, nor must it be too deliquescent.

A satisfactory way to use the flux is to moisten it with water to the consistency of a thin paste. A convenient flux container is made from a piece of 3-inch pipe as shown in Fig. 2. An aluminum, brass or glass flux container should be used. Iron is likely to cause contamination by chemical reaction with the flux. A day's supply of the flux and water solution should be made up each morning. If any of the solution is left in the container over night, it should be thoroughly broken up and stirred the next morning as it tends to lump and crystallize upon standing. The flux is made slightly hygroscopic to prevent it from drying out and blowing off the seam ahead of the welding torch.

If a welding wire is used the wire is dipped into the flux solution, or if no fillet metal is used, the flux is applied to the joint by means of an ordinary hand brush.

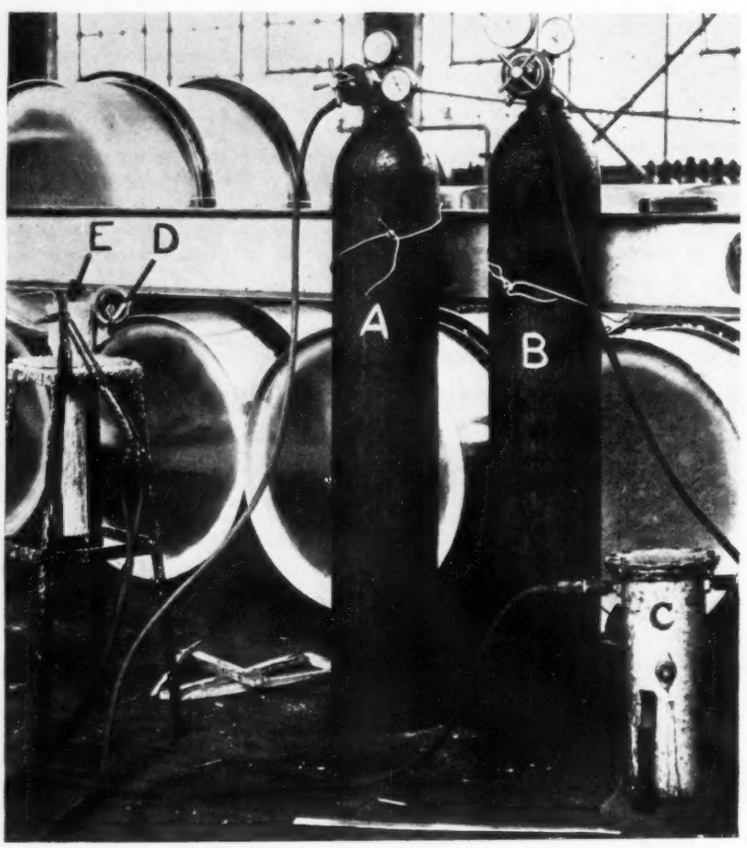


Fig. 1—Assembly of welding apparatus: (A) oxygen container, (B) hydrogen container, (C) flashback chamber, (D) torch, and (E) flux container

Welding Rod Important

Of utmost importance is the selection of the proper welding metal. The use of a welding rod or feeding stick is necessary with all but the thinnest sheet. Commercially pure aluminum (2S) and aluminum-manganese alloy (3S) should be welded with a pure aluminum welding stick. For welding the strong aluminum alloys (17S, 25S and 51S) a 5 per cent silicon welding stick is recommended. However, a welding stick of the same composition as the alloy to be welded will give satisfactory results if proper allowance may be and is made for expansion and contraction.

The silicon welding alloy has a relatively slight solidification contraction and on account of its having a lower melting point than the base metal, it remains molten longer and fills in the voids caused by the solidification contraction of the base metal in the same way that a gate fills in the voids of a casting. This means that the stresses due to contraction which might otherwise cause incipient cracking in the base metal shift their effects to the metal supplied in welding. This metal which is noteworthy for its freedom from hot shortness, which probably means ductility at temperatures just under the melting point, as well as strength at these temperatures, will stand the stresses without the development of cracks or fissures.

Caution is necessary in using a 5 per cent silicon alloy welding stick. If the welded articles are to be subjected to a high temperature or "solution" heat treatment after welding, it will be necessary to recognize the fact that this amount of silicon lowers the safe temperature to which some of the strong alloys may be heat treated. Whether the original material is 51S, 25S, 17S or aluminum-copper alloy, it will be safe to use heat treating temperatures up to about 940 degrees Fahr. even when the 5 per cent silicon alloy is used for welding.

The sizes of welding wire recommended for use with various gages of aluminum and aluminum alloys are

given in the table which follows:

Thickness to be welded B. & S. gage	Inches	Welding wire Dia. inches
Up to 18	Up to 0.040	0.080
18 to 16	0.040 to 0.051	0.092
16 to 14	0.051 to 0.064	0.104
14 to 12	0.064 to 0.081	0.116
12 to 10	0.081 to 0.102	0.128
10 to 8	0.102 to 0.128	0.144
8 to 6	0.128 to 0.162	0.160
6 to 4	0.162 to 0.204	0.176
4 to 2	0.204 to 0.258	0.192
2 to 00	0.258 to 0.365	0.212

Light aluminum sheet (0.050-inch and lighter) is usually flanged in preparation for welding as in Fig. 4. The flange should be about the same height as the thickness of the sheet or just a little higher. The joint is made by holding the two upstanding edges together and melting these down. For such work as this no welding rod is required. Beveling is unnecessary for light sheet.

Heavier sheet can be beveled as is usual with steel plate. However, it is easier to obtain full penetration by notching the sheet as shown in Figs. 3 and 5. The edges of the sheet are cut through the entire thickness, the notches being about as deep as the thickness of the material, and about one-fourth inch apart. In welding, the edges are butted close together. By preparing the edges in this manner, the flux works down for the full thickness of the material, and considerable welding rod is saved. There is less chance of "burning through" and the notches act also as little expansion joints, minimizing local distortion.

Particular care is needed when preparing the broken edges of an aluminum casting for welding, since occasionally these are porous and may contain absorbed oils, which, if not removed, will cause blowholes in the weld. A good plan is to heat the edges before beginning to weld when the absorbed grease will be sweated out and can be wiped off. Perhaps the best cleaning mediums are a wire scratch brush and some gasoline. Adjacent surfaces above and below the weld should be cleaned with the scratch brush and washed in gasoline. Aluminum sheet ⅜-inch and thicker should be preheated. Preheating will limit the consumption of oxygen and acetylene to that required for the actual melting of the seam. Furthermore, preheating will tend to prevent distortion. If the base metal for some distance on either side of the seam is maintained at a temperature not greatly below the melting point, then, when the torch is applied to any one point, the additional expansion of this will be small and is unlikely to cause distortion. However, local preheating must be applied with care, especially in castings, for the presence of strengthening ribs, or other devices which tend to prevent the free expansion of the parts, can possibly lead to fractures during the preheating.

The preheating of the whole object is not always possible, and in such cases local preheating must be resorted to. When total preheating is adopted there is little danger of expansion cracks, provided the heating is done slowly and uniformly, and that the object is well protected from drafts during welding.

The work should be supported so that the under side of the weld is free, in order that the added thickness of metal in the weld may form a slight bulge on the under surface which can afterwards be dressed down if desired. A strip of asbestos which has been previously heated to drive off moisture makes an excellent backing material for the welding of aluminum.

There is no danger of metal falling away during the welding, even when the underside is unsupported, unless the weld is excessively wide or the thickness dealt with is large, or melting is carried too far.

At times it is advantageous to use jigs to hold the edges in proper relative positions. Where work is done in production, careful study of the matter of design and construction of jigs and fixtures will well repay the effort and expense involved.

As heat is applied to aluminum its temperature increase and the metal temperature increases and the metal of aluminum is about twice as great as that of iron and one-half as much again as that of copper. In addition to the volumetric or dimensional change due to expansion, there is also the irresistible nature of the force which produces this growth. Therefore as the metal heats and expands, we must deal both with the new dimensions involved and also with the tremendous forces which produce this growth. The reverse action takes place as the metal cools and contracts.

In fusion welding, heating is accomplished by applying a torch to one area, therefore the object is not heated uniformly. If a torch is applied to the center of a sheet of aluminum, the sheet will be heated at that point and the metal all around the central area will also be heated, but to a decreasing extent moving farther away from the point of heat application. The metal will tend to expand accordingly, the center growing more than the concentric area farther away. This tendency to grow can be accomplished only by a buckle forming in the sheet. If the sheet is perfectly flat and at a uniform temperature before heat is applied, the buckle will rise toward the flame. The sheet will not buckle downward away from the flame and this is due to the fact that the surface nearest the flame is the hottest. This in an important detail in connection with welding sheets because some of the major troubles and difficulties with which a welder is concerned are due to warping and buckling of the sheets. After completion of the weld all the heat which has been put into the work must be dissipated. When the metal cools the processes described above will be reversed.

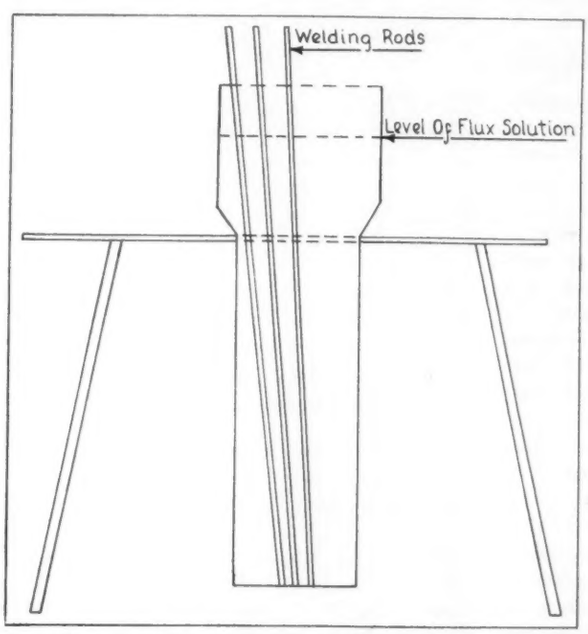


Fig. 2—Flux container made from 3-inch pipe

In view of the rapid growth in the use of aluminum and aluminum alloys and the consequent need for satisfactory methods of fabrication, the accompanying treatise on welding is unusually timely. It is abstracted from a paper presented before the Philadelphia section of the American Welding society, April 16, 1928. The author is metallurgist, technical direction bureau, Aluminum Co. of America, New Kensington, Pa.

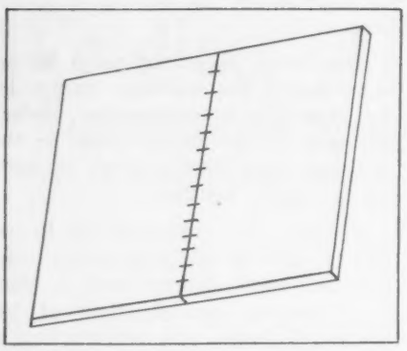


Fig. 3—Light plate prepared for welding by notching edges

Undue care, therefore, must be exercised in practice that the net result of expansion and contraction will be zero. If the dimensions cannot come back to what they were originally the work will be severely strained.

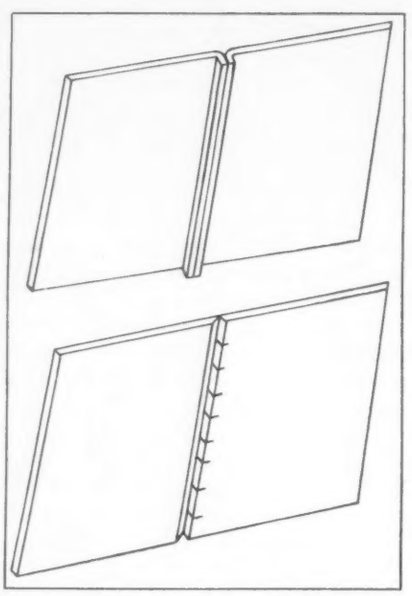
In welding aluminum one of the main points in which the process deffers from that of steel is in the speed of working. The speed is very much greater than with steel, and the movement along the seam becomes more rapid as the metal becomes heated.

The welding rod is held loosely in the fingers of the left hand, and it is kept in a direct line with the weld. Both sides of the weld must be heated equally so that the edges will melt at the same instant, otherwise a bulky and uneven weld will result. It is also important when starting that the two edges should commence to melt before any filling material is melted. The welder quickly learns to judge the correct instant to commence running up the seam. If the torch is kept at an angle of about 30 degrees to the surface of the sheet it will prevent too rapid melting.

Welding Commercially Pure Aluminum

The assembly of parts before welding is gone about as in welding steel sheet of the same thickness. Long seams should be tack-welded progressively from end to end at intervals of three or four inches in order to prevent the edges slipping by each other. Intermittent tack-welding produces an unsightly weld and is likely to cause cracks. After tacking, the flame of the torch is played upon both edges of the pieces simultaneously causing them to melt, and the oxide being removed by the flux the molten edges flow together and coalesce. Only a small part of the metal is melted at any one time, so that the molten metal is prevented by surface tension from dropping away. The welder progresses rapidly along the seam, the edges melting under the torch and solidifying almost immediately as the torch passes on. In welding long seams, if pronounced buckling starts by the metal shrinking in or out, it should be straightened by hammering before proceeding further with the welding. When a welding rod is used, the tip of the rod should be held in the flame near the metal. Metal from the welding rod is flowed into the weld by the flame as the heat in the puddle alone is not sufficient to melt the rod.

In the case of a hard rolled pure aluminum sheet, the zones on either side of the weld usually constitute the weakest part, for the thickness at the weld itself can be increased by the addition of welding rod, and the weakness of the cast structure at the weld counteracted by this means. The annealed zones on either side of the weld remain, however, so that whatever the original temper of the metal the final strength will be about 14,000 pounds per square inch.



Sheet Prepared for Welding

Fig. 4 (Above)—Flanged the thickness of sheet. Fig. 5—One edge notched, other beveled at 45 degrees

Simple alloys are readily welded in the same manner as commercially pure aluminum sheet, and the same sort of conditions apply. Thus, hard rolled sheets, after welding, will exhibit the three zones: (a) cast metal at the weld; (b) softened regions on either side, and (c) the remote parts of the metal which have not been affected by heat of welding.

With heat treated alloys such as 17S, 25S and 51S, it might be expected that if the whole object is submitted to heat treatment after welding the original strength could be regained. However, these alloys in the case condition are much less susceptible to heat treatment than the wrought metal. Therefore, while the partially annealed zones on either side of the weld would respond to heat treatment, the cast metal in the weld would be much less affected.

Duralumin is extremely hot-short and care must be taken to avoid contraction strains when welding this alloy. Such strains may be minimized by preheating or when this is not feasible, by observing such a sequence in assembling the article to be welded that the metal adjacent to the weld will be free to contract without setting up undue strains on the weld. Perhaps one of the best means of preventing cracking from contraction strains is to use a 5 per cent silicon rod.

When a broken aluminum casting is to be welded, it first should be cleaned carefully, removing every trace of oil, grease and dirt by means of a wire brush and gasoline. Unless the casting has a heavy cross-section, it is not necessary to tool the crack or cut out a vee. If a piece is broken out it should be held in correct position by light iron bars and appropriate clamps, so attached as to avoid straining any portion. The casting, particularly if a large one, should be preheated.

A charcoal furnace is not necessary when filling holes in castings. The area is preheated locally by playing the torch about the hole. The hole should be shaped up so as to remove all pockets and to permit proper manipulation of the torch. In filling blowholes, the cavity should be thoroughly cleaned so that only clean metal is exposed.

For filling holes in welding castings, it is usually preferable to use a weld

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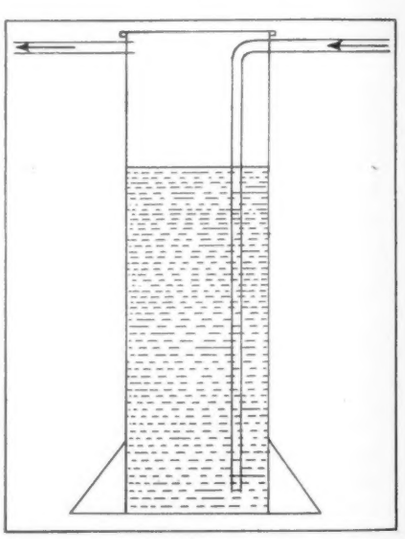


Fig. 6—Longitudinal section of flashback chamber

Twelfth Article—Design of Pickling Departments—Part II

SHEETS pickled with a radial arm machine are stacked in a rack and held open by pins. The sheets receive two immersions. In the first tank the acidity is 6 to 7 per cent and the temperature is 170 to 180 degrees Fahr. In the second tank the acidity is 5 to 6 per cent and the temperature 160 to 170 degrees Fahr. In the first tank the scale is broken off and almost completely removed. The pickling time is 4 to 10 minutes. The cage then is lifted and turned 90 degrees and lowered into the second tank. The action in this tank is to clean the sheets and remove the balance of the softened scale. The vertical raising and lowering with a jerk at the bottom of the stroke opens the sheets, forces the solution between and washes off the loose scale.

The machine again is lifted and turned 90 degrees and the sheets from the second tank are lowered into a tank of cold running water free from mud and organic materials. Sometimes a hot rinse is used. The important factor is to use pure water to prevent staining the sheets.

Wire pickling is done by a radial arm machine, in groups or nests of oval tanks; and, in square tanks set in a row directly under a monorail system. The coils are placed on a rack each end of which is suspended by a chain from the arm of the overhead structure. The arms are raised and lowered and the racks with the coils are turned through 90 degrees and lowered into the tanks in the order desired.

In the group method nine pickling tanks of 800 to 1000 gallons capacity frequently are employed. Generally the tanks are oval in shape and constructed of wood. The steel rinse tank is for cold running water and the capacity is about twice the capacity of the pickling tanks. The pins hold eight to 14 coils of wire or about 2400 to 3000 pounds. The coils are raised and lowered by a jib crane. A motor on top rotates the crane through 180 degrees. On a horizontal boom there is a cylinder of air or steam with a 6-foot stroke which raises and lowers the chain. Suspended from the end of the chain is one or three hooks. The idea of three hooks is to give the craneman three chances instead of one to hook into the eyelet or pin. Three hooks will dispense with the extra man required to insert the single hook in the eyelet. It takes the craneman about 30 minutes to make a complete round of changing and emptying the tanks which includes the insertion of nine pins.

PART II of the twelfth article on pickling processes, written exclusively for IRON TRADE REVIEW. The first article in this series was presented in the Oct. 27 issue. Succeeding articles will discuss pickling for black tinning, tinning of copper, and enameling. The author is metallurgist, electric materials department, Hubbard & Co., Pittsburgh.

The solutions are generally 5 to 7 per cent acidity by weight and the temperature about 160 degrees Fahr. Some wire mills add 40 to 50 pounds of fresh acid to each tank after each pin has been lifted out to maintain the acid strength. One modern method is to start with high acidity at low temperature ranging from 140 to 150 degrees Fahr. and to use a sufficient quantity of a good inhibitor to control the high acid strength. This latter method permits the tank to be operated four to six hours without replenishing the acid. The pickling time is about 30 minutes and the tanks are operated 24 to 48 hours before they are emptied.

After being removed from the pickling tanks with the best practice the wire is washed with water under pressure of 80 to 160 pounds. This washes off all the impurities and the coils then are immersed in a rinse tank. In the event a sull coating is desired the pin is lifted from the rinse tank and placed on the sulling rack to receive the brown sull coating. If no sull coating is desired the pin is removed with another crane and placed in a lime solution immediately before baking. On rope wire pickling the tanks are dumped when they have

been used about six hours. That means they are dumped four times a day.

By using square tanks set in a row directly under a monorail system two pins can be put in each tank. The same practice is used as just described except that only eight coils are placed on each pin to prevent the wire from touching in the solution. The motive power is generally an electric hoist operated by the pickle foreman. Compressed air is not practical as the valves freeze in the winter time. The tanks can be constructed of wood or concrete with a brick lining. They are agitated by steam and compressed air. When low temperature is desired for alloy wire, compressed air is used.

A large percentage of the average pickling troubles in pickling pipe is due to a lack of tank capacity. Three methods of pickling pipe are employed:

1. Pipe for conduit is pickled in round vertical tanks 12 to 14 feet deep and 6 to 8 feet diameter. Agitation is by steam or air.

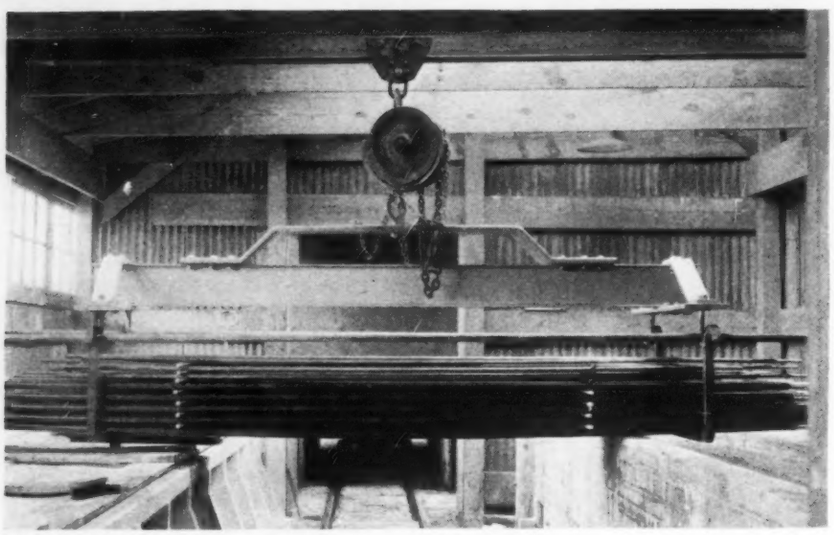
2. Square tanks set on rockers. The tank is rocked from 10 to 15 degrees, the solutions being washed over the material.

3. Rectangular tanks with the pipe resting in cages rocked in the solution.

The solutions in the round vertical tanks are sometimes at atmospheric temperature. Agitation is with air. The acidity runs about 6 to 8 per cent by weight and the pickling time varies with the amount of silica scale on the inside seam. The oxide scale often is removed in 15 to 20 minutes. It takes three to four hours, however, to remove the silica scale. When heat is used the temperature varies from 140 to 160 degrees Fahr. and the pickling time two to three hours. If an inhibitor is used in these solutions the pipes can be threaded on both ends before pickling without any damage to the threads. This obviates taking the pipe back to the machine shop to be threaded, but instead it can be passed immediately after rinsing and drying to the finishing department where the material is inspected by looking through each tube at an electric light. An important step prior to pickling pipe with cut threads is to immerse the pipe in a boiling solution of some approved metal cleaner. This is followed by a dip in boiling water prior to pickling.

Pickling pipe for galvanizing or seamless tubes is done in tanks 25 to 30 feet long, 6 feet wide and 5 to 6 feet deep. There is no agitation except the steam at both ends of the tank. The solutions vary from 6 to 7 per cent acid by weight and the temperature from 160 to 180 degrees Fahr. For seamless tubes the temperature is 150 to 160 degrees Fahr. The pipe is lowered into the tank by an overhead crane and two chains fastened around the batch an equal distance apart. The pickling time varies from one to three hours, depending on the amount of silica scale. The pickling time for seamless tubing is one-half to one hour. The pickling time varies with the scale, especially the silica scale on pipe being galvanized. The amount of acid consumed per ton varies with the foregoing practice. It is good practice to pickle pipe with about 50 pounds of acid per ton. The size of the pipe is an important factor also to be considered. The pipe is removed from the pickling tank, immersed in cold water for about 30 minutes, then dipped in a muriatic solution, drained, and placed on a drying oven preliminary to galvanizing.

Sulphuric and muriatic acids dissolve sand or silica scale but slightly. The bisk scale on pipe from the bottom of the furnaces is an iron silicate. It would seem, therefore, that the scale could be removed much more quickly by pickling in a mixture of muriatic and hydrofluoric acids at about 120 degrees Fahr. A little hydrofluoric acid in the sulphuric acid should also shorten the pickling time. The iron oxides are attacked by the sulphuric and muriatic acids, and the silicate is attacked and disintegrated by the hydrofluoric acid. The latter should be handled with care and under no condition allowed to come in contact with the flesh.



CHAIN BLOCK AND LIFT EMPLOYED FOR HANDLING BARS IN AND OUT OF PICKLING VATS

How Black Plate Is Handled

Four-armed radial machines are used in pickling tin plate; there are two pickle tanks, one rinse tank, and the fourth arm is used for filling the crates. The steel is piled on edge in the crates without pins as the gage generally is light. The crate is lowered in the first solution which is about 6 per cent in acid strength. The acid is fed into the tank in a small stream about the size of a lead pencil. The temperature is held at about 170 to 180 degrees Fahr. The scale is almost entirely removed in the first tank. The sheets then are put into the second tank which cleans them thoroughly. The strength of the acid in the second tank is about 6 per cent at the start and little acid is added during the day as a good inhibitor will hold it at about this strength for eight hours.

The action in the second tank is to thoroughly clean the sheets. The rinse tank is the most essential feature in the cleaning and pickling of tin plate. There should be a large volume of water and a complete change should be made between immersions from the second tank. This is the secret of good tin plate today. Pickling and rinsing requires from 4 to 7 minutes in each tank. When the crate is lifted from the rinse tank and placed on a rack four men generally are employed to remove the black plate and to fill the racks immediately. The clean sheets are placed on a table beneath bright electric lights and are inspected on both sides for spots. A rigid inspection at this point will save rejections after the sheets are tinned, or coated. Following inspection the stock is placed in the annealing box wet.

No. 1 tank in good practice is emptied every 5 to 6 hours and a fresh solution made. Tank No. 2 can be operated 24 to 36 hours without

being drained. The amount of acid used per ton for pickling black plate varies from 80 to 110 pounds per ton, depending on the gage and weight and the proper amount of a good inhibitor.

Continuous pickling is a late development in pickling sheets and strips. The advantages are:

1. Longer and heavier coils can be cleaned quickly.
2. The acid consumption per ton is lower.
3. The labor cost is lower.

Strips generally pass through scale breakers to remove or break up the scale before going to the pickling tanks.

The layout for continuous pickling requires a building from 200 to 300 feet long and from 20 to 30 feet wide. Pickling tanks are set end to end and are 75 to 120 feet long. The tanks either are made of wood lead lined, or concrete brick lined. Agitation is by steam jets which point in one direction on the left side and the opposite direction on the right side of the tank. There are six to eight jets.

Numerous Inlets Provided

Acid is fed into the tank from an auxiliary supply tank equipped with a glass gage to show the acid on hand. It enters each tank at three to five different places. The coils at the charging end are placed on revolving plates set on a roller bearing to relieve the tension on the strip in the tank. The strips are fastened to each other by modern methods of spot welding, or each end of the strip is punched with an eyehole and the strips are linked together with an I-shaped link.

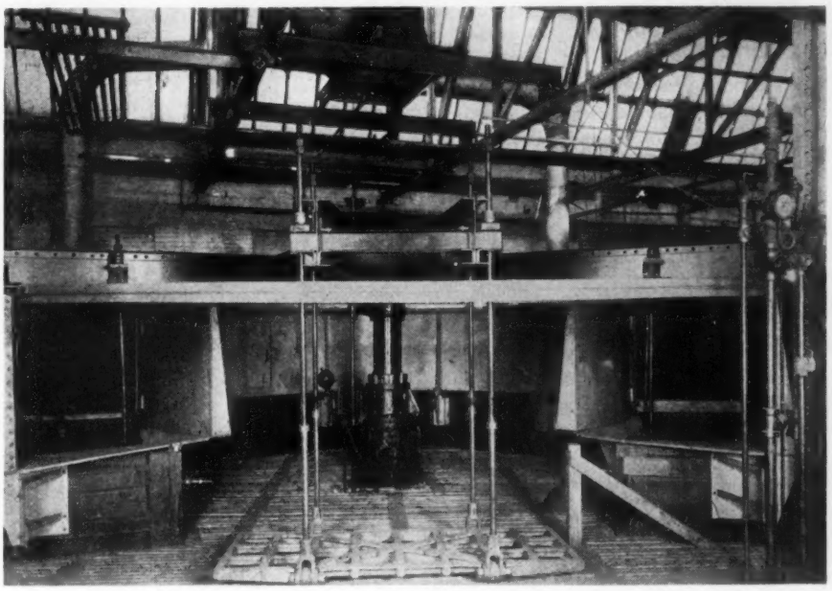
The strip passes under the roll in the end of the first tank. The roll is made of hard wood or vitrified acid-proof earthenware; the latter is preferable. The strip drags along the bottom of the tank and for this reason agitation is most essential to produce a clean strip. At regular intervals, about 6 feet, half-round acid-proof tile pipe, on which the strips slide, extend across the bottom and are wedged tightly to the side of the tank.

In the first tank the scale is broken off or completely removed. The acid varies from 8 to 12 per cent by weight and the temperature from 170 to 190 degrees Fahr. The strip passes out of the first tank under a tile roll into the second tank. Here the acid varies from 6 to 8 per cent and the temperature from 160 to 170 degrees Fahr. This solution whitens the steel and cleans off any black carbide smudge or film. The strip then passes into a cold water solution. No cleaning compound of any kind should be used in this tank. Potassium cyanide has been tried to put a white finish on the steel, but it quickly becomes contaminated by the sulphuric acid dragged over with the strips. The rinse tank is generally 6 to 8 feet long.

The strips then pass over iron rolls into a boiling water rinse tank. It is most essential and imperative that this water be free from any organic matter, mud, or salts to avoid yellow stains. The temperature is maintained from 200 degrees Fahr. to the boiling point. If the strip has been electrically spot welded it then passes through rubber rolls 8 inches in diameter. If the strip has been punched and linked it is sheared to individual lengths. From the boiling rinse water the strip passes into the dryer, which is about 8 feet long. This is similar to a muffle furnace the strip not coming in contact with the flame.

Should it be desirable to put a lime coating on the strip the solution is made of one-half sack of pebbled lime to 1000 gallons of boiling water. This is of sufficient strength to neutralized and will not show on the steel. The strip now passes to a reeling machine the speed of which varies with the size and gage of the steel, ranging from 20 to 50 feet a minute. The whole operation frequently is stopped due to the failure of a link, the improper linking at the charging end, or the sticking of a coil on the finishing end reel, and there will be instances when the strip will be idle in this strong acid solution from one to five minutes. As the equipment is electrically driven there are times when the power may be completely cut off, and the strips would become badly pitted by the acid before they can be raised out of the solution. It, therefore, is essential to use an inhibitor for safety.

In pickling alloy steels especially those containing nickel and chromium the temperature must not be allowed to exceed 140 degrees Fahr. This is to avoid the black smudge, and to prevent pitting of the steel. This precaution must be observed mainly because the reaction of the acid is active, and the steel is easily burned. An acid strength of 5 to 6 per cent should be the limit and the steel must be watched carefully. Sulphuric and muriatic acids are used together in the first tank. The metal is rinsed in cold water and then immersed in a nitric acid solution from 5 to 10 minutes and then must be rinsed quickly in cold water to prevent oxidation and eliminate stains. At times when an impervious spot appears an abrasive method must be used to remove these spots.



RADIAL ARM TYPE PICKLING MACHINE FOR REMOVING THE SURFACE SCALE FROM SHEETS. THE UNIT IS EQUIPPED WITH AN EXHAUST SYSTEM

Sheet Committee Moves

Offices of the Sheet Steel Trade Extension committee are to be moved from the Oliver building, Pittsburgh, to rooms 508-11 Terminal Tower building, Cleveland, April 28.

Gear Makers Continue Progress

American Gear Manufacturers Association Holds Spring Meeting in Rochester—Convened There in 1921

Discuss Problems Confronting the Industry—New Officers and Directors Are Elected for the Coming Year

SURPASSING in attendance any previous meeting, the American Gear Manufacturers association conducted its spring convention at Hotel Seneca, Rochester, N. Y., April 19-21. More than 100 members and guests were registered for the three-day sessions which were devoted to technical papers, standardization and numerous problems confronting the gear makers.

Conditions in industry regarding the production and merchandising of gears was the topic of one afternoon session under the direction of the industrial group. Considerable discussion of a valuable nature developed. Increased research was advocated by a speaker at a general session who pointed out that improved products and production economies are best secured in that way. Many committee reports were presented, the majority simply recording progress. Perhaps the most important was that proposing suggesting standards for future design for bevel gear nomenclature.

At the banquet on Friday evening, the attendance was over 200, this also being a record. Dexter S. Kimball, dean of the college of engineering, Cornell university, Ithaca, N. Y., was the principal speaker. In the afternoon, an inspection trip had been made to the Gleason Works.

Must Eliminate Waste To Increase Profits

REDUCTION of costs only through the legitimate effecting of economies and engineering research was advocated by President E. J. Frost in a brief address as he called the meeting to order. Attention was directed to general conditions and competition in the gear making industry, following which he made certain recommendations to members of the association. The following statement which appeared recently in a house organ served as a text:

"When a business firm attempts to mold its whole policy to meet the prices of its competitors, that business is entering a labyrinth, the center of which is the chamber of despair. Highest quality never can be given nor obtained at the lowest prices. If a price can be sacrificed, quality must be sacrificed. If quality is sacrificed, society is not truly served."

Commenting on this, Mr. Frost said:

"We must bear our share in the general program of reduction of costs to the consumer so long as such reductions can be legitimate and be done through increased efficiency of men, methods and machines. Quality must be sacrificed for quantity, but a larger product must be obtained through better education of our producers, through elimination of wastes that are common in nearly all shops, through creating an active interest on the part of the workmen that will make each man feel he is not a mere routine worker, but that he is a definite unit in a co-ordinated whole; and too, the office should bear its share of the program by buying satisfactory materials at right prices, by seeing that materials are in the shop on time, that jobs are started in their proper sequence and by giving maximum care to selection of the most efficient machine tools, small tools, furnaces and other equipment.

"I believe sincerely in the adoption of some plan to minimize industrial accidents, to prevent disease and to provide proper first aid and nursing service. Many costly mistakes are made because workmen should be wearing glasses and often it happens that the man knows nothing of his need until his eyes are examined.

"Good will and peace of mind among workmen are wonderful assets in any manufacturing plant, and these things have to be cultivated if not actually earned by the management through relationships founded on mutual understanding and a working adaption of the Golden Rule, or as Charles Schwab puts it, 'today, co-operative action is essential as a means of advancing the interests of any industry. The day of the individualist,

About 100 members of the American Gear Manufacturers association were luncheon guests

when personal interest overshadowed all other motives, has passed. It has been forcibly demonstrated that individual prosperity depends absolutely upon the success of the industry; that no individual can permanently prosper at his industry's expense.'

"Let me express the hope that we will follow up what was started at the Jackson meeting by making an occasional pilgrimage to some worthwhile college or university so as to build up an acquaintanceship between us, who consider ourselves practical, and the so-called theoretical side of engineering. If we do this, I am sure we will open, mainly through engineering research, avenues of profit without which many of us will find ourselves using carmine to write the financial story of past performance.

"It has been estimated by the department of commerce that $30,000,000,000 is wasted annually in industry, and that a large part of this loss could be prevented by intelligent use of competent laboratories. This being true, it is up to us not only to employ the well-trained product of our universities, but to see to it that young men of unusual ability are educated for our future needs. Instead of eternally carping about prices, let us see if preventing or at least salvaging some of this enormous waste will change loss into profit."

New Officers

AMERICAN GEAR MANUFACTURERS ASSOCIATION

President
A. F. COOKE
Vice president and Pittsburgh manager, Gears & Forgings Inc., Pittsburgh

First Vice President
B. F. WATERMAN
Engineer, Brown & Sharpe Mfg. Co., Providence, R. I.

Second Vice President
E. W. MILLER
Chief engineer, Fellows Gear Shaper Co., Springfield, Vt.

Treasurer
W. G. JONES
President, W. A. Jones Foundry & Machine Co., Chicago.

Secretary
T. W. OWEN
3608 Euclid avenue, Cleveland.

Using a number of interesting charts, J. C. McQuiston, manager, department of publicity, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., described the program which his company has been following for the past year in advertising its products. He corrected an erroneous impression that newspapers are being used exclusively and stated that trade magazines serve a most useful purpose and are being patronized extensively. The Westinghouse company makes a most complete survey of the market for each product it manufactures, then places its advertising first in trade and technical magazines best serving the various market and second, newspapers in chosen localities.

Markets frequently are limited geographically or seasonably, thus advertising of some commodities in mediums of national character is not of maximum effectiveness. But judicial selection of trade papers and newspapers does result in complete coverage and when properly timed proves extremely helpful to dealers. Much of the material appearing in the daily press necessarily is of an educational type. In concluding, Mr. McQuiston pointed out that regardless of the product manufactured, a sales survey must be made before an effort is made to send the message to the buyer.

In a paper, "Gear Lubrication," G. A. Round, assistant chief engineer, Vacuum Oil Co., New York, discussed the specifications for automobile transmission oils. In addition to providing the necessary lubrication to the gears, the oil must have long life and must permit easy shifting through a wide temperature range.

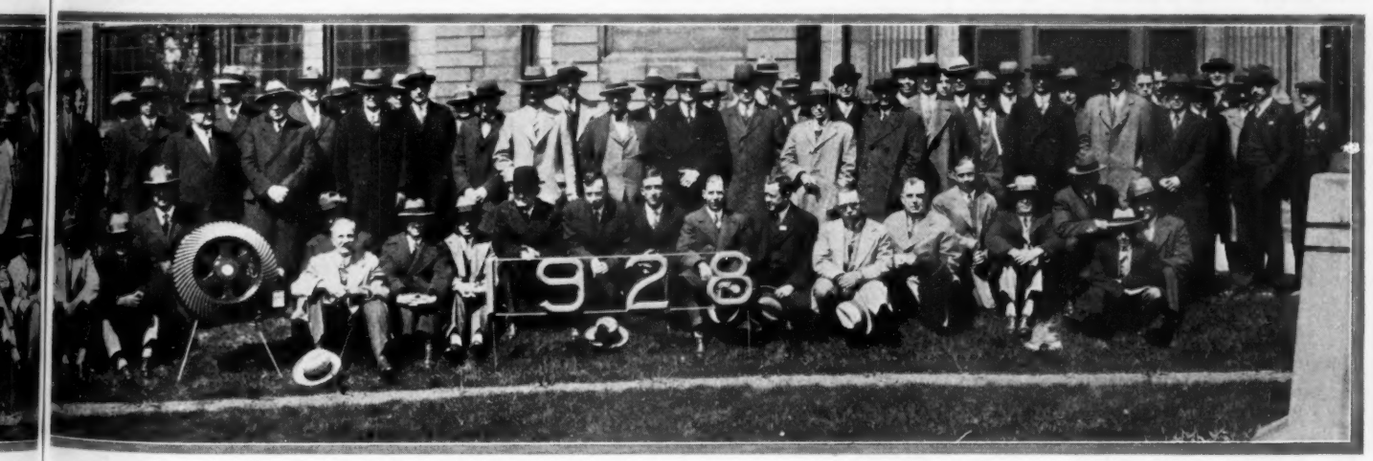
Industrial Research Essential to Existence

SPEAKING before the Thursday evening session, T. C. Roantree, micarta engineer, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., discussed the application of fabric or nonmetallic gears. These gears are made in two types: First, those consisting of a number of layers held together between metal side plates or shrouds; and, second, those consisting of layers of fabric formed by the application of pressure and heat. Phenolic fabric gears are about 14 years old. Formerly it was believed that the tooth angle should not be less than 30 degrees, but today gears from this material are made with any type tooth form.

The speaker stated that the principal uses of nonmetallic gears are to provide quietness of operation; to reduce vibration; to give resiliency; to relieve grinding conditions in dust-laden atmospheres; to give protection from corrosion where acid is present. In the three years preceding 1928, the use of nonmetallic gears has trebled. In concluding, Mr. Roantree said that any ordinary method of lubrication could be employed but that it is essential that some type be used to give the proper wearing properties of the material.

Heat treating steels by the dilatometer or change in volume method was described by Stanley P. Rockwell, consulting metallurgist for the American Gear Manufacturers association, Hartford, Conn. A number of charts and reels of motion pictures were employed to illustrate the use

(*Concluded on Page* 1111)

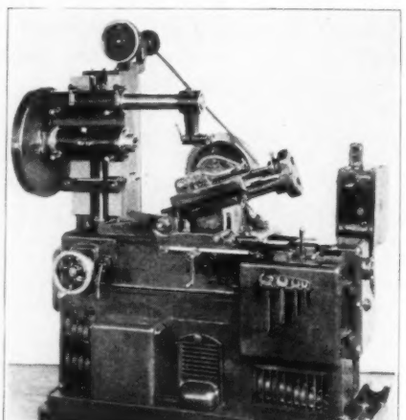


guests of the Gleason Works, after which they were conducted through the plant

Improves Automatic Gear Cutting Machine

No. 103

Brown & Sharpe Mfg. Co., Providence, R. I., has redesigned its automatic gear cutting machine to make it more productive and easier to handle. Spur and bevel gears, clutches, segments and many other common jobs can be cut conveniently on this machine, which features simplicity in set-up. As shown in the illustration, the machine has been made heavier throughout and the capacity increased to 4 diametral pitch in cast iron and 5 in steel. It is of the motor-in-the-base type. An ample supply of cooling air is circulated about the motor through louvers at front and rear of the compartment. Adjustment of the prestretched driving chain is made by movement of the plate on which the motor is mounted. The cutter slide is of rigid construction with the counterweight arrangement integral with the machine. The cutter slide has a maximum travel of 5½ inches and a minimum of ½-inch, permitting the machine to handle work requiring short strokes. The oiling system has been simplified, permitting the operator to lubricate all parts of the machine quickly. Due to the general increase in strength and ruggedness, the tool weighs 4000 pounds.



No. 103—Automatic gear cutting machine

Puts Roller Bearings on Drop Hammers

No. 104

Chambersburg Engineering Co., Chambersburg, Pa., is announcing the application of roller bearings to the rolls of its line of board drop hammers. This is said to represent a gain not only in considerable saving of power and in better maintenance of alignment, but also in the elimination of interruptions of operation for oiling and changing bushings. Hammers usually are oiled at least twice daily, and even then lubrication is not always complete, though there is a surplus of oil that finds it way to the

Iron Trade Review's Calendar of New Equipment

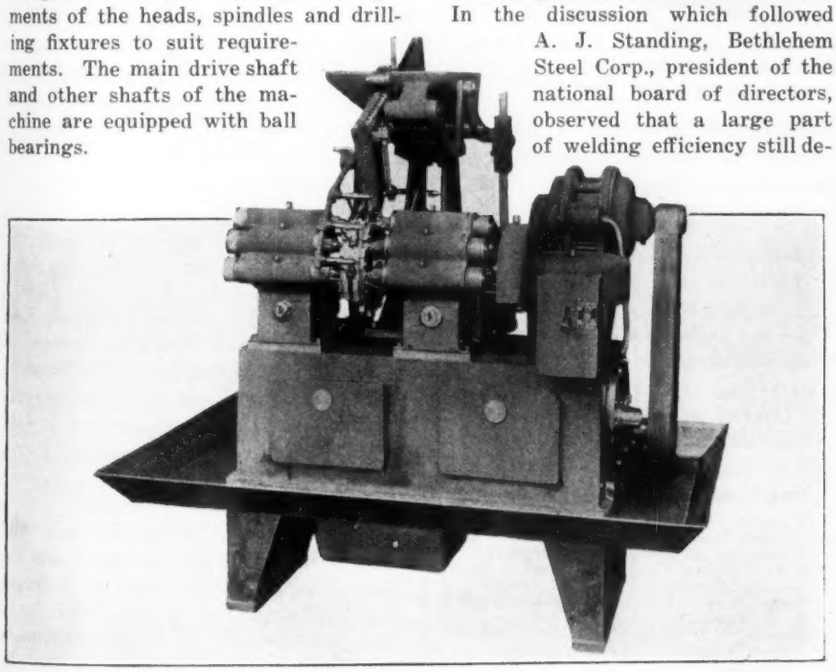
No.	Item	Builder	Comment	Date Described
81.	Cement gun	S. Obermayer Co.	Air operated; for refractories	March 29
82.	Universal iron worker	Buffalo Forge Co.	Larger size punch, shear and bar cutter	March 29
83.	Riveting machine	Hanna Engineering Works	Pneumatic; for chassis frames	March 29
84.	Riveting machine	Hanna Engineering Works	Pneumatic; for tractor wheels	March 29
85.	Swing-frame grinder	Norton Co.	For high-speed snagging work	March 29
86.	Electric arc welder	General Electric Co.	Combined with gasoline tractor	April 5
87.	Electric arc welder	Westinghouse Electric & Mfg. Co.	Motor-driven; mounted on wheels	April 5
88.	Electric arc welder	Lincoln Electric Co.	Gasoline engine driven	April 5
89.	Diesel engine	Fairbanks, Morse & Co.	For drilling oil wells; portable	April 5
90.	Air filter	National Air Filter Co.	Unit type; uses new medium	April 5
91.	Grease cup	Hunter Pressed Steel Co.	Improved design; cadmium finish	April 5
92.	Gas producer fuel feed	Wellman-Seaver-Morgan Co.	Double-bell type; adjustable	April 5
93.	Across-the-line motor starter	Cutler-Hammer Mfg. Co.	Alternating current; gives full protection	April 12
94.	Magnetic switch	General Electric Co.	Places squirrel-cage motors across line	April 12
95.	Brinell testing machine	Brown Bayley's Steel Works Ltd.	Portable; operates on new principle	April 12
96.	Electric solenoid brakes	General Electric Co.	Models for alternating and direct-current	April 12
97.	Manhole cover	United Filters Corp.	Incorporates locking device	April 12
98.	Automatic rod magazine	Brown & Sharpe Mfg. Co.	Feeding device for automatic screw machines	April 19
99.	Portable conveyor	Link-Belt Co.	Light-weight; motor-driven	April 19
100.	Combination bench machine	Niagara Machine & Tool Works	Turns, wires and burrs sheet metal	April 19
101.	Portable electric tools	Hisey-Wolf Machine Co.	Two drills and bench grinder	April 19
102.	Packing cutter	Chickasaw Machine & Foundry Co.	Cuts fibrous packing to exact fit	April 19
103.	Gear cutting machine	Brown & Sharpe Mfg. Co.	Automatic; redesigned; more productive	April 26
104.	Board drop hammer rolls	Chambersburg Engineering Co.	Roller bearing; increases board life	April 26
105.	Automatic drilling machine	Hammond Mfg. Co.	Six-spindle; drills cap screw heads	April 26

boards, shortening their life materially. The packing of the roller bearings insures good lubrication over long periods without reaching the boards. Hereafter the company will supply its hammers with either roller bearings or plain bearings.

Screw Drilling Machine Given Six Spindles

MTR No. 105

Hammond Mfg. Co., Cleveland, has developed a multiple-spindle automatic drilling machine with three spindles in each of the two sliding heads. The feed is obtained from cams mounted on a shaft in the bed of the machine, and through levers to the heads. The machine shown in the illustration is arranged to drill ⅛-inch cross holes in the heads of ½-inch cap screws, drilling to a ¼-inch center hole in the head of the screw. The screws are automatically fed from a hopper to bushings in a wheel and carried to the first drilling position; two sides are drilled; the drills are withdrawn; and as the wheel is indexed to the second position, the screw is indexed one-sixth of a turn for the second drilling operation, after which the screw is again indexed and carried to the third pair of spindles where the final drilling operation is performed and the screw then is ejected. With six spindles working as above, the actual drilling time for a completely drilled screw is the time required to drill one side. At each station there is a device which holds the screw head firmly in position while drilling is under way. The machine is designed to allow various arrangements of the heads, spindles and drilling fixtures to suit requirements. The main drive shaft and other shafts of the machine are equipped with ball bearings.



No. 105—Automatic six-spindle machine for drilling cap screw heads

DISCUSS FUTURE OF WELDING

Association of Iron and Steel Electrical Engineers Holds Annual Conference at Cleveland

MORE than 200 members and guests of the Association of Iron and Steel Electrical Engineers attended the annual welding conference held at Cleveland April 20 under the auspices of the national welding committee.

The delegates met at Hotel Statler in the morning and following a reception, went to the plants of the Cleveland Crane & Engineering Co. and Lincoln Electric Co. where they spent the afternoon inspecting welded products. The crane company exhibited a completely welded 10-ton electric traveling crane, as well as welded trolleys and numerous other crane parts. The Lincoln company showed its welding machines and also the production of motors in which welding is used extensively.

J. C. Lincoln, president, Lincoln Electric Co., was the principal speaker following a dinner at the Hotel Statler in the evening. Discussing the subject, "Arc Welding Is Selling Steel," he predicted that savings in the United States as a result of the general application of arc-welding may exceed $150,000,000 annually. "Methods for forming, methods of welding, designs for minimum cost, etc., are wide-open fields in which only a small amount of work has been done," declared Mr. Lincoln. "In this field is the greatest opportunity for engineering talent that now exists."

In the discussion which followed A. J. Standing, Bethlehem Steel Corp., president of the national board of directors, observed that a large part of welding efficiency still depends upon the welder, and declared that more extensive welding instruction in the technical colleges would go far to aid progress. "It may be that new structural designs will have to be originated for welding purposes," he said. "In any case, steps must be taken to co-operate with city engineers to ratify welding practice."

William R. Hopkins, city manager of Cleveland, joined with Lincoln Dickey, manager of the city's public auditorium, in urging the national organization to pay a return visit for the annual convention and exhibition.

Mr. Standing outlined the program of the national meeting in Chicago June 24. Endeavors will be made, he indicated, to codify a set of rules there on high tension practice at steel plants. He urged greater effort in the development of the junior division of the organization.

Seated at the speakers' table were, in addition to Messrs. Lincoln and Standing: J. F. Kelly, managing director, Association of Iron and Steel Electrical Engineers; S. S. Wales, Carnegie Steel Co., former president; A. G. Place, Youngstown Sheet & Tube Co., secretary; C. S. Proudfoot, U. S. Ferro Alloys Corp., first vice president; Frank W. Cramer, Bethlehem Steel Corp., second vice president; W. J. Harper, Donner Steel Co., director; John A. Oartel, Carnegie Steel Co., director; A. L. Reichert, Bourne-Fuller Co., director; Elbert Lewis, Illinois Steel Co., director; J. C. Hopkins and S. L. Henderson, American Steel & Wire Co.; J. H. Bode, president, Wellman-Seaver-Morgan Co.; W. G. Wehr, Cleveland Crane & Engineering Co.; J. M. Ireland, Westinghouse Electric & Mfg. Co.; D. Martignone, General Electric Co.; G. A. Lamberton, National Tube Co., Cleveland, chairman and Thomas E. Monks, Guardian Trust Co., Cleveland. A. G. Place, chairman of the conference, presided.

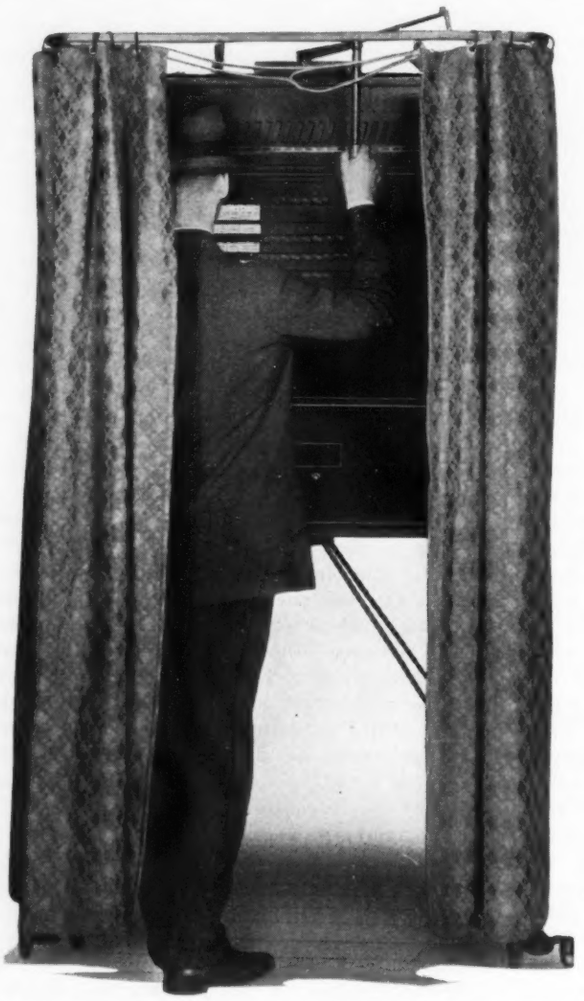
Arrangements for the conference were in charge of A. R. Lintern, Nichols-Lintern Co., secretary of the Cleveland division of the association.

Orders estimated at $1,250,000,000 are likely to be placed in the next 12 years by the Central Electricity board of England. Fusion of electrical interests in England to prevent loss of business to foreign manufacturers is contemplated.

Large Uses of Steel in Small Ways

Voting Machines

114th Article



It is impossible to vote on the machine while the curtain is open. A lever closes the curtain and unlocks the mechanism

VOTING machines have been increasing slowly but steadily in popularity, and approximately 2000 of them now are manufactured annually in the United States. The machines are designed to fill a definite need in the election system, and what they accomplish may be summarized as follows: They make voting easy and swift, render defective ballots impossible, insure a secret vote, prevent buying and selling votes, guarantee an accurate count, announce election returns immediately, make impossible any tampering with the record, and reduce election expenses. So simple and speedy is the procedure that as many as 1054 voters have voted on one machine on an election day, and election officials have reported that an average of one voter a minute can "cast" his vote on the voting machine without undue pressure. During the past 30 years upward of 50,000,000 ballots have been cast by mechanical means. One authority estimates 1000 tons of steel is used annually in the manufacture of voting machines in the United States. The steel is mainly in the form of sheets, bars and angles. A leading type of voting machine consists of the following parts: Voting, recording, interlocking and irregular ballot mechanisms.

The principal part of the voting mechanism is a large cold finished steel plate on which are provided cardholders for the ballot labels, and voting pointers. Above each candidate's space there is a voting pointer which is moved down to voting position when the voter desires to cast his vote for a particular candidate. The parts for this mechanism are made of brass and steel of exacting specifications.

In the recording mechanism there are 300 or more small adding machines, the number depending on the size of the voting machine. They are so constructed in the back of the voting machine that they will show the results, on counter wheels, of the votes cast on the voting pointers of the voting mechanism at the front of the machine. The counter wheels, made of an alloy metal, represent the ultimate in precision die casting. The frames and supporting columns are made of cold finished steel. Cold drawn bronze rod is used for the bearing shafts of the counter wheels. The interlocking mechanism, which allows the voter to vote for all of the candidates for whom he is entitled to vote, but prevents him from voting for more candidates than he is entitled to vote, is constructed on a wedge and roller principle. When a voting pointer is turned down over a candidate's name this action lifts up an interlocking rod. At the end of the interlocking rod is a wedge which moves the rollers in the particular section on which the vote is cast, so that no other rods can be raised in the section, preventing the movement of all other voting pointers.

The interlocking rods are made of cold finished strip sheet. To meet the requirements of the voting machine this steel must be of accurate specifications as to flatness, temper, and gage, being held within 0.002-inch of the specified thickness. The wedge fashioned at the end of the interlocking rod is sized to dimension.

The irregular ballot provides for voting for persons not appearing on the regular ballot. The voter lifts a slide at the top of the machine and writes the name of the candidate for whom he desires to vote on a paper roll. The raising of the slide locks the pointers of all other candidates for the particular office for whom the unnominated candidate was voted.

THIS is the one-hundred fourteenth of a series of articles dealing with some of the obscure uses of steel which go far toward absorbing the American tonnage.

Among articles appearing every two weeks and not included in Vol. I containing 51 separate descriptions are:

Vacuum Bottles	*Suspenders*
Highway Guards	*Screw Hooks*
Numbering Machines	*Steel Bridging*
Joist Hangers	*Mail Boxes*
Straight Razors	*Steel Shelving*
Piano Wire	*Automobile Bumpers*
Type Molds	*Tire Chains*
Swords	*Bathroom Fixtures*
Paving Guards	*Snow Fences*
Reaction Kettles	*Stairs*
Fire Screens	*Cork Screws*

Editorials

Another Challenge to Steel

ACCORDING to newspaper reports the Lincoln Highway association is contemplating a marking of this national highway from coast to coast by concrete posts. The executive committee of the association has invited designs for a suitable concrete post carrying a red, white and blue marker on its face and a black concrete arrowhead on one or both sides. Designs are to be sent to the association's office, General Motors building, Detroit, for consideration on May 1, 1928.

It is likely that the association has made a study of various types of signs. In fact it is stated that in 1920 the association abandoned the practice of painting its insignia on telegraph poles and other local objects and instead erected enameled steel signs on individual posts in the belief that they would be reasonably permanent. Experience proved these were satisfactory within corporate limits, but in the open country because of the characteristic "ping" they returned to a bullet or the chipped condition made by a thrown stone they frequently were defaced.

It would seem that this situation is a challenge to the steel industry. Certainly steel is adapted to this particular purpose. If the steel interests had devoted half as much attention to the problem of working out beautiful designs for its product, as have the concrete producers, the chances are that the Lincoln Highway association would not now be placed in the position of having to try some other material because steel has proved disappointing. Here is a wonderful field for practical research.

Frills Bow to Mass Production

MAN is slave to his subconscious mind as he invents or designs, according to Dexter S. Kimball, dean of engineering, Cornell university. Speaking at the banquet of the American Gear Manufacturers association at Rochester last week he said the majority of our household articles, working tools and even clothes we wear are fashioned along lines and bear decorative touches which the conscious mind cannot explain.

Why does a dining room table have lion's paw feet; a sewing machine have roses painted on the overarm and be supported on a grapevine base; a handsaw carry a fancy carved design in the handle; or a machine tool have ornate legs? Dean Kimball explained that a device is created for its usefulness, but immediately the designer wishes to make the product attractive and in so doing introduce furbelows of a most absurd nature and suggested beyond a shadow of a doubt from the subconscious mind. In proof, he showed by lantern slides how today we are employing the same basic but somewhat modified patterns found in early Greece.

Happily, the modern tendency, perhaps induced by mass production, is to simplify design. Where are the frills on adding machines, automobiles, cash registers or telephones?

Small Tax Cut Better Than None

WHILE the conference committee of congress has been mulling over the tax reduction bill, business and industry and the tax-paying public generally have been faced with a possible failure of any tax reduction whatever this year. On the one hand, the house representation on the joint committee is insistent upon a reduction program of nearly $300,000,000. On the other, President Coolidge has indicated plainly he will veto a bill that would reduce the government's income more than $200,000,000.

The fault lies with the lack of responsibility of individual members of congress in supporting heavy appropriation bills without regard to a source of revenue to meet them. The country needs a tax reduction program this year. It would be extremely unfortunate if the zeal for a huge tax reduction program would result in no tax cut at all. Taxpayers prefer the certainty of even a small reduction to the vague possibility of a larger one.

Status of Structurals Improves

IN COMPARING the production of concrete reinforcing bars, steel ingots and structural steel in 1926 with that of 1910 and generalizing on the result, one is likely to obtain a false impression as to the relative present status of these products. For instance, in that period the annual output of concrete bars increased 238 per cent, that of steel ingots 85 per cent and that of structural steel 73 per cent. This shows unquestionably that in the 16 years, reinforcing

steel has gained more proportionately than has steel ingots on structural steel. But it does not warrant the statement that "structural shapes are not keeping pace with ingots."

According to the figures of the American Iron and Steel institute, the production of gross tons of three products during the past five years for which complete statistics are available are as follows:

Year	Concrete Bars	Steel Ingots	Structural Shapes
1922	575,816	35,602,926	2,718,768
1923	680,867	44,943,696	3,405,197
1924	656,122	37,931,939	3,283,708
1925	810,587	45,393,524	3,604,130
1926	815,829	48,293,763	3,911,663

The year to year changes in per cent of the outputs of the three products during this period have been as follows:

	1923	1924	1925	1926
Concrete bars	18	— 3.6	25.0	—0.4
Steel ingots	26	—15.0	19.0	6.4
Structural shapes	25	— 3.5	9.7	8.5

Taking the five years as a whole the increase in the output of concrete bars amounted to 41.6 per cent, steel ingots 35.6 per cent and structural shapes 43.8 per cent. Thus in the normal years since the wartime period structural steel has more than held its own with concrete bars and with steel ingots.

Italian Steel Wages Guaranteed

BENITO MUSSOLINI'S political and economic laboratory has evolved a new product which seemingly is a bit Utopian. News dispatches tell of an agreement signed between steel workers and employes in Italy which sets at naught supply and demand and variable business conditions.

The pact has the effect of law. Its provisions are that every steel worker is guaranteed a minimum wage by the state, whether the employing company has a full quota of orders or none at all. No employe is to be laid off under any circumstances. In times when production is low employers will continue to pay wages so long as financial conditions will permit and then payment will be from a mutual benefit fund to which employes and employers contribute.

Interesting developments may be expected to follow this experiment in economics. It is not stated whether capital invested in the business is also guaranteed a minimum wage, to be paid whether earned or not; whether the steel workers agree also to produce material as fast as demand calls for it, in return for being paid wages when they do not work; where the minimum wage will come from when the benefit fund is gone.

Yet the Duce has done some seemingly impossible things and this plan should not be condemned in advance, however seemingly impossible of realization. Always someone is doing the impossible while others are declaring its impossibility.

What Our Readers Are Thinking

Mechanization Helps Labor

To the Editor:

I HAVE read your editorial "More Machinery Needed—Not Less." You have dealt with the subject in a very convincing and excellent manner.

Of course, I cannot realize that any thinking person would advocate a policy of promoting inefficiency. Fundamental in American life, in all its phases, particularly as pertaining to industry, has been the seeking, obtaining and establishing of more and more efficiency in all activities. It has been outstanding in our national progress.

It is a narrow and unsound viewpoint to assume that the promotion of efficiency through the application of labor-saving devices affects adversely the laboring classes. Quite the contrary, it improves their position.

I heartily concur in your advocacy of strongly combating any such false beliefs.

E. G. GRACE, *President,*
Bethlehem Steel Co.

Bethlehem, Pa., April 13, 1928.

Too Much "Viewing with Alarm"

To the Editor:

I SEE that Senator Shipstead has gone Senator Wagner "one better" and estimates unemployment to be about 7,000,000. A few more senators might soon find we are all out of a job, and the whole country starving.

I read your editorial, "More Machinery Needed—Not Less," in the April 5 issue, and agree with you that producers of machinery ought to show the economic idiocy of the theory that Senator Smoot is advancing.

Senators and other politicians are much given to viewing things with alarm according to their own political interests in campaign years. Of course, you can't expect much more from men of the Shipstead type. It would be very amusing to find out how Shipstead arrives at his wonderful figures of unemployment. I suspect from the newspaper accounts, that he is taking the indexes of factory employment which show fewer people employed in certain New York factories and then he is adding all the people that move from farms to cities, probably with the intention of starving to death, and gets the wonderful figures that he has been broadcasting.

He, of course, forgets that not only gas stations but garages, automobile repair shops, bus and truck transportation, beauty parlors, aeroplanes, radios, public road work and a thousand other things have absorbed a great many people since 1921. If he ever knew it, he may not have forgotten it; being of the type that is more likely simply to say nothing about perfectly obvious things that are not in point with their pet projects.

E. F. DUBRUL, *General Manager,*
National Machine Tool Builders' association.

Cincinnati, April 6, 1928.

IRON TRADE REVIEW

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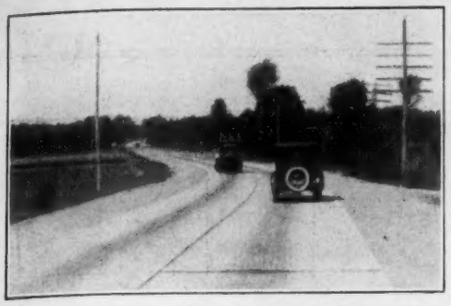
E. L. SHANER, Editor. — *J. D. PEASE, Advertising Director.* — *F. F. LIGHT, Circulation Manager.*



Roadbuilding Survey Shows Increase in Use of Steel. Page 1063.

ALUMINUM is becoming so closely associated with steel in many modern applications requiring lightness and strength, that an article on practical welding of the light metal and its alloys, beginning on page 1066, is considered timely. The low price of aluminum as compared with a few years ago has made it more available for general use, and consequently methods of fabricating the material assume greater importance. The article affords the reader the benefit of much practical experience and outlines the principles of welding sheet and cast aluminum.

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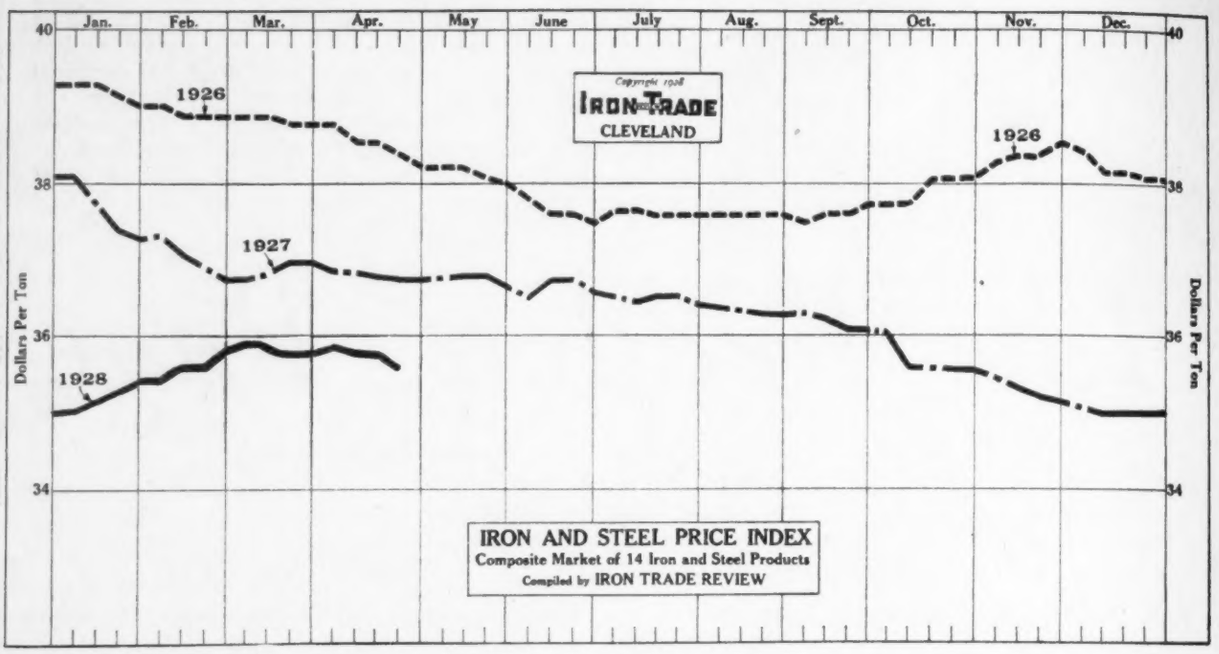
The Business Trend



Ore Price Determination Removes Uncertainty

By JOHN W. HILL, Financial Editor

WITH Lake Superior iron ore prices established firmly on the basis of 1927 levels by recent sales in the open market aggregating 2,000,000 tons, much of the uncertainty regarding manufacturing costs in the iron and steel industry that develops at this time of the year has been removed, and producers can now proceed with their plans with a reasonable assurance of stability. The purchase of a record breaking tonnage by the Ford Motor Co. in view of the increasing production of its own mines is an indicator of this important interest's appraisal.

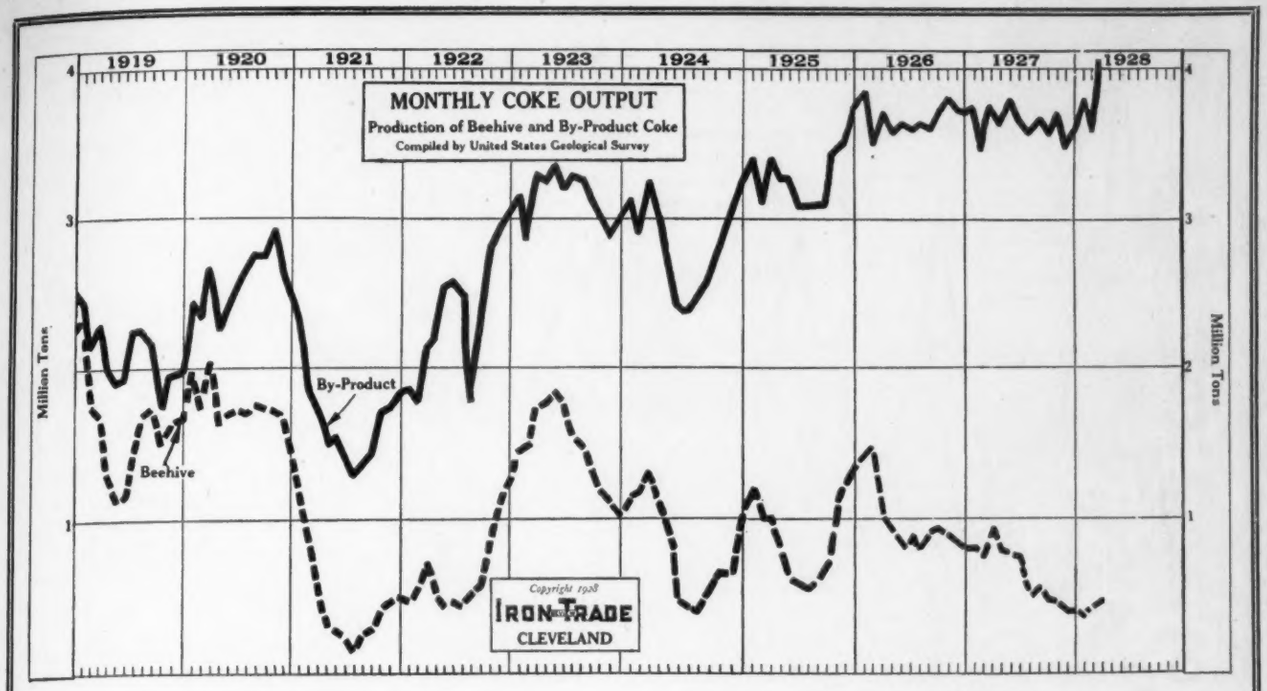
WHILE the pig iron market is in between two buying movements, and therefore current business is light, the melt shows evidence of holding up as indicated by shipments which so far in April are at a rate equal to or better than in March. It is significant that each month so far this year has shown an increase in pig iron shipments. Makers are equipped with large backlogs, some of them filled up to normal capacity for second quarter, though continuing to crowd on their books further tonnage at what they consider unprofitable prices, as a sort of buffer against the possibility of a decline in shipments.

SOME effects of backward weather are appearing, especially in the West, but this has not yet become definitely a drawback to commodity purchasing. Without a flood calamity such as visited the Mississippi Valley a year ago backwardness in planting is small cause for alarm.

LITTLE attention is being paid to the approaching political season, though it is little more than a month until conventions assemble. The bogy of the presidential year seems of little effect up to this time.

UNEMPLOYMENT, which was of sufficient degree a few weeks ago to call forth denunciation of machinery, as taking bread from the mouths of workmen anxious to serve, has begun to slip back into desuetude. Men are being taken on in numbers and the percentage of idlness other than from choice is slight. Various factors seem to promise further decrease in the number of unemployed. For one thing, outdoor work is just beginning to open up and many of the normally jobless will be thus absorbed. The Ford Motor Co. at Detroit and its branch assembly plants is steadily augmenting forces.

The Business Trend

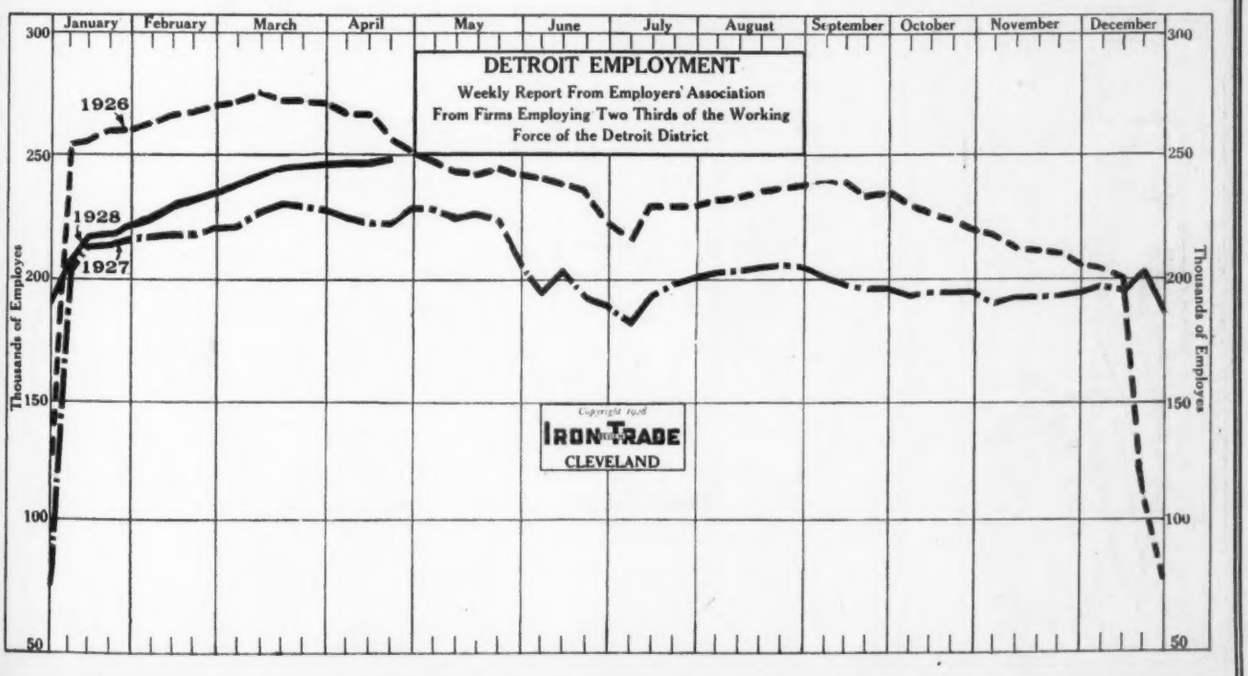


Coke Production

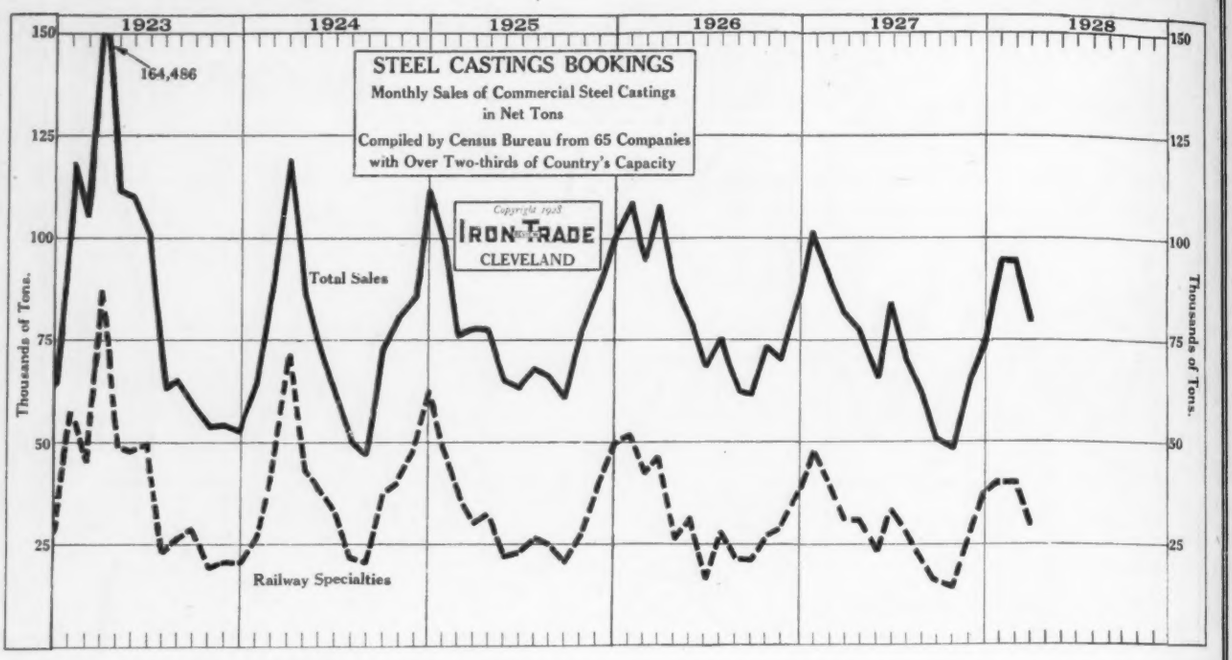
BY-PRODUCT coke production in March shot up to a point not reached since the war and probably an all-time high when it reached 4,065,000 net tons, according to the federal bureau of mines. This compares with 3,723,000 tons in February. Beehive coke output also registered a gain, attaining a mark of 449,000 net tons contrasted with 390,000 tons in February. By-product figures show the increasing trend toward this grade of furnace and foundry fuel, with beehive production under the 1927 level.

Detroit Employment

EMPLOYMENT in the Detroit district is at the highest point in two years and within a short distance of the all-time record of 1926. In the week ended April 14 those plants reporting to the Employers' Association of Detroit had 249,988 persons on their pay rolls, an increase of 2547 over the preceding week and 25,340 over the same week of 1927. These figures are based on returns from plants employing two-thirds of the working force of the Detroit area and mirror the automotive situation chiefly.



The Business Trend

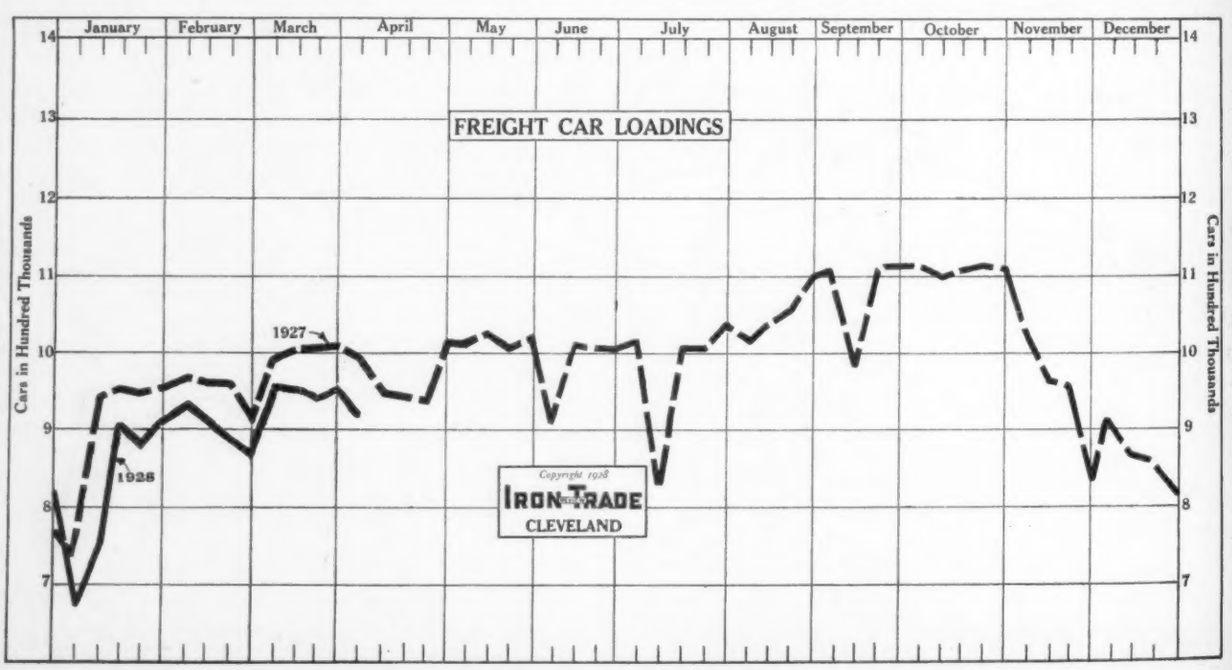


Steel Castings Sales

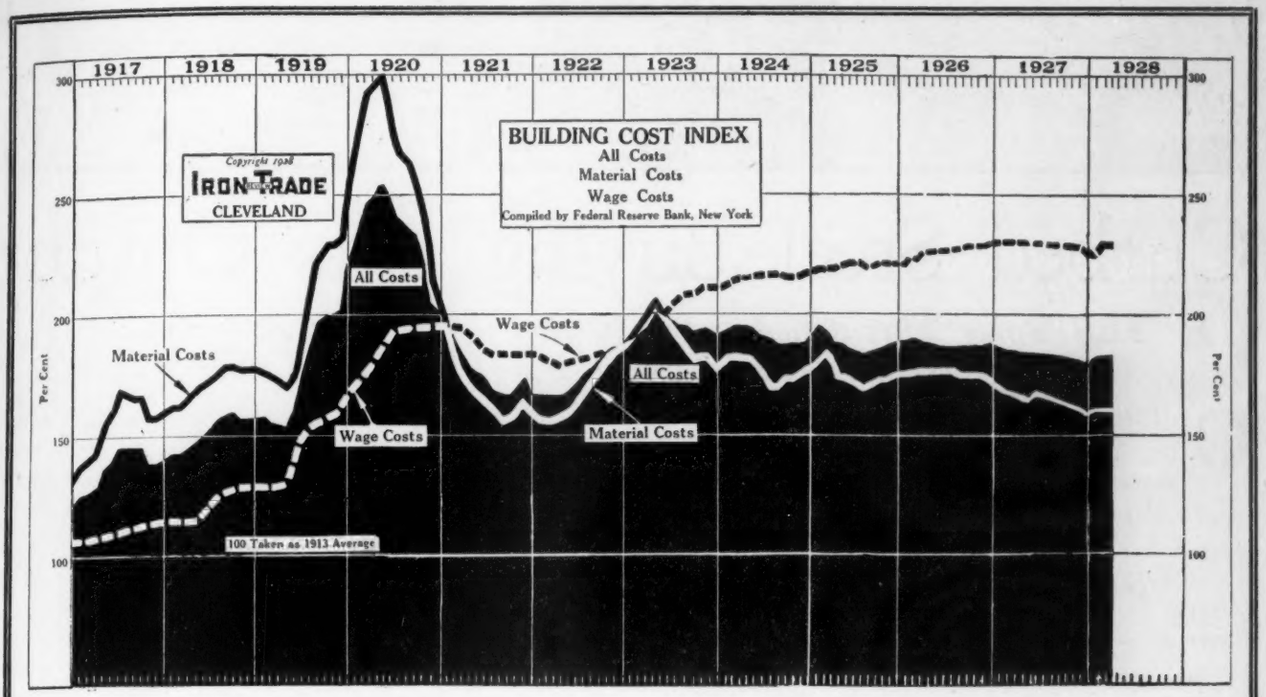
BOOKINGS of commercial steel castings in March declined below the levels of the preceding month and the corresponding 1927 period. Total sales reported by principal manufacturers were 81,834 tons, compared with 90,244 tons in February and 90,041 tons in March of last year. Orders placed for railway specialties amounted to 30,956 tons, against 41,096 tons in February and 34,680 tons a year ago. Total sales for the quarter were 263,147 tons against 292,503 tons in the 1927 period.

Car Loadings

WHEN the railroads loaded only 919,296 cars of freight in the week ended April 7, according to compilations of the American Railway association, car service division, they developed further easiness in the general situation. It is encouraging, however, to note that a year ago car loadings also dipped, only to recover the latter part of April. In fact, 1928 thus far reveals a striking similarity to 1927 except on a slightly lower plane. In the week ended March 31 the railroads loaded 950,249 cars.



The Business Trend

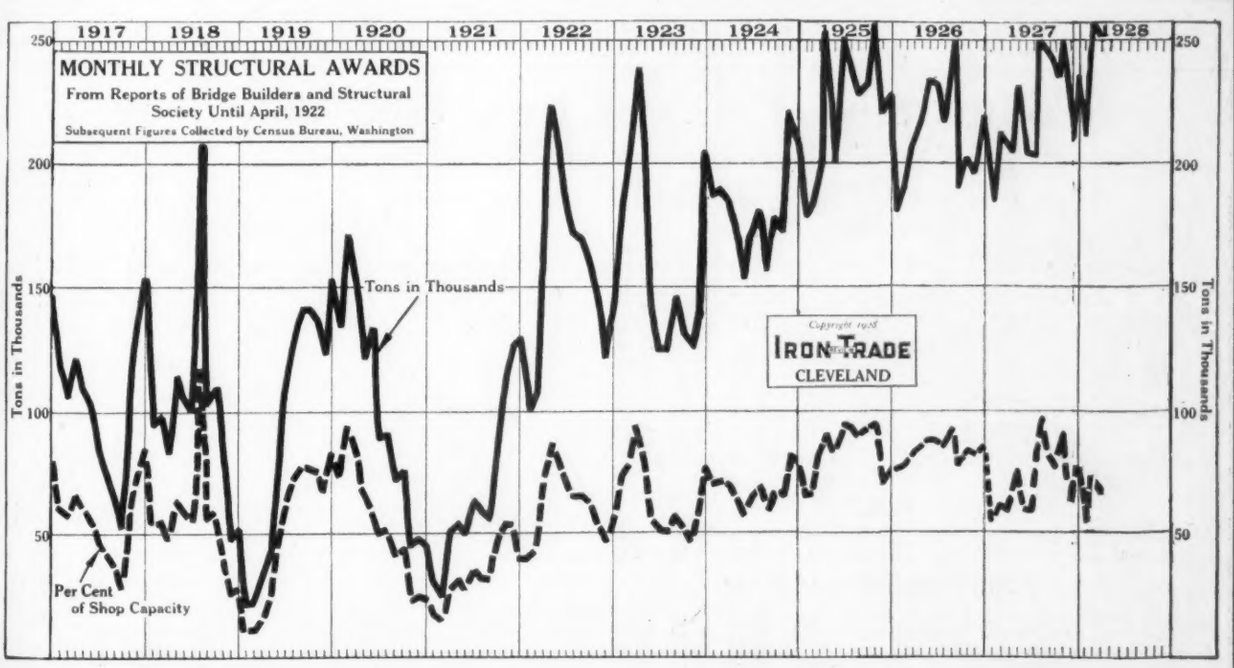


Building Costs

BUILDING costs were unchanged during March for the second consecutive month, holding to the level attained by a slight upturn in January. The index of total costs, compiled by the New York federal reserve bank, stands at 186, compared with 192 a year ago. The index of wage costs continues at 230, the peak of all times. This compares with 229 for March, 1927. The material cost index holds at 157, slightly less than the figure a year ago. The price situation in structural steel now is easier.

Structural Awards

STRUCTURAL steel sales in the first quarter of 1928 exceeded those of the opening periods of both 1927 and 1926, according to department of commerce statistics. March actual bookings of fabricated steel are reported at 202,251 tons, a slight recession from the 212,068 tons of February but an increase over the 189,982 tons of last March. The first quarter total now stands at 735,000 tons, against 671,250 tons a year ago. Computed bookings in March are placed at 258,750 tons.



Curbed Steel Buying Hits Output

Mill Rates Threatened but Situation Tops Year Ago—Basic Iron Weaker—Car Buying Up—Pipe Prices Hold

CONSUMERS of finished steel continue to buy sparingly, being well protected a short distance ahead or inclined toward conservatism for price or seasonal reasons, and this policy is beginning to cast its shadow over the production end of the industry. Only a wave of buying in the final days of the month could have sustained operations at the high levels that carried over from March, and this has not developed nor is it in prospect.

Pittsburgh Rate Drops as Chicago Holds

A checkered situation is in the making, as one result. Pittsburgh district ingot production has slipped from 85 to 80 per cent. Chicago holds at 95 per cent, but the blowing in of a steelworks blast furnace stack there is meaningless because one is being dropped this week. Finishing mill operations in the Mahoning valley have risen coincident with curtailed ingot output. Buffalo, at 85 per cent, is off slightly. Steel corporation subsidiaries are unchanged at 88 to 90 per cent.

When current activity is measured against last April and the tendency of the second quarter to ease off is considered, the factors of strength are dominant. More pig iron and finished steel apparently are being produced and shipped this month than a year ago, prices are higher than in last April despite the present unsettlement, and order books of most producers are heavier than at this time last year.

Automotive production ebbs and flows according to individual manufacturers but continues the chief outlet for iron and steel. Ford business is broadening, without yet having materially affected demand from competing makers. Railroad pressure for speedy delivery of track material is unabated, and in the past week car buying has been fair. Farm implement interests have not yet dropped into the lull between the tillage and harvesting equipment periods. Building steel awards are at the seasonal average, with large inquiry promising important gains.

Test Reveals Weak Basic Price

Basic iron, nominally $17, Valley, has succumbed to the first real test in weeks. For 3000 to 4000 tons for its Alliance, O., plant the American Steel Foundries is reported to have paid $17, delivered, to an Ohio producer, indicating a $16,

Comparative Prices of Iron, Steel and Coke

Representative Market Figures for This Week, Last Month, Three Months and One Year Ago

	April 25, 1928	Mar. 1928	Jan. 1928	Apr. 1927
PIG IRON				
Bessemer, del. Pittsburgh	$19.26	19.21	19.26	21.26
Basic, valley	16.00	17.00	17.00	19.00
Basic, eastern, del. eastern Pa.	19.25	19.50	19.50	20.90
*No. 2 foundry, del. Pittsburgh	19.01	19.01	19.01	20.26
No. 2 foundry, Chicago	18.50	18.50	18.50	20.00
*Southern No. 2 Birmingham	16.00	16.00	16.00	18.00
*Southern Ohio, No. 2 Ironton	19.00	19.00	19.00	20.00
**No. 2X, Virginia furnace	20.50	20.50	20.50	22.00
**No. 2X, eastern, del. Phila.	21.26	21.26	20.51	22.26
Malleable, valley	17.25	17.25	17.25	18.50
Malleable, Chicago	18.50	18.50	18.50	20.00
Lake Superior charcoal del. Chicago	27.04	27.04	27.04	27.04
Gray forge, val., del. Pittsburgh	18.76	18.51	18.51	19.76
Ferromanganese, del. Pittsburgh	104.79	104.79	104.79	104.79
*1.75 to 2.25 silicon. **2.25 to 2.75 silicon.				
COKE				
Connellsville, furnace, ovens	2.60	2.60	2.70	3.20
Connellsville, foundry ovens	3.60	3.75	3.75	4.05
SEMIFINISHED MATERIAL				
Sheet bars open-hearth, Youngstown	32.50	33.75	34.00	34.25
Sheet bars, open-hearth, Pittsburgh	34.00	33.70	34.00	33.75
Billets, open-hearth, Pittsburgh	33.00	33.00	33.00	33.50
Wire rods, Pittsburgh	44.00	44.00	41.50	42.50

	April 25, 1928	Mar. 1928	Jan. 1928	Apr. 1927
FINISHED MATERIAL				
Steel bars, Pittsburgh	1.85	1.90	1.80	1.90
Steel bars, Chicago	2.00	2.00	1.90	2.00
Steel bars, Philadelphia	2.17	2.17	2.12	2.22
Iron bars, Chicago	2.00	2.00	1.90	2.00
Shapes, Pittsburgh	1.85	1.90	1.80	1.90
Shapes, Philadelphia	2.07	2.08	2.08	2.12
Shapes, Chicago	2.00	2.00	1.90	2.00
Tank plates, Pittsburgh	1.85	1.90	1.80	1.85
Tank plates, Philadelphia	2.10	2.10	2.05	2.22
Tank plates, Chicago	2.00	2.00	1.90	2.00
Sheets, black, No. 24, Pittsburgh	2.75	2.85	2.80	2.80
Sheets, blue anl., No. 10, Pittsburgh	2.00	2.10	2.10	2.20
Sheets, gal., No. 24, Pittsburgh	3.65	3.75	3.65	3.65
Sheets, black, No. 24, Chicago	3.05	3.05	3.05	3.00
Sheets, blue anl., No. 10 Chicago	2.25	2.25	2.25	2.40
Sheets, galvanized, No. 24, Chicago	3.90	3.90	3.90	3.90
Plain wire, Pittsburgh	2.50	2.50	2.40	2.40
Wire nails, Pittsburgh	2.60	2.65	2.50	2.55
Tin plate, per base box, Pittsburgh	5.25	5.25	5.25	5.50
SCRAP				
Heavy melting steel, Pittsburgh	15.00	14.75	15.35	16.50
Heavy melting steel, eastern Pa.	13.75	13.75	14.00	14.75
Heavy melting steel, Chicago	12.75	12.75	12.25	13.10
No. 1 wrought, eastern Pa.	15.25	15.25	15.25	16.75
No. 1 wrought, Chicago	12.90	12.45	12.65	13.50
Rails for rolling, Chicago	14.00	14.45	15.00	15.35

Current Prices for Rolled Steel Products

PRICES IN CENTS PER POUND UNLESS OTHERWISE INDICATED

STEEL PLATES

Pittsburgh	1.85c to 1.90c
Philadelphia, del.	2.10c to 2.15c
New York, del.	2.175c to 2.225c
Boston, del.	2.265c to 2.415c
Chicago	2.00c
Cleveland	2.04c to 2.09c
Buffalo	2.00c
Coatesville, Sparrows Point	2.05c
Birmingham	2.05c
Pacific coast, c.i.f.	2.25c to 2.30c

STRUCTURAL SHAPES

Pittsburgh	1.85c to 1.90c
Philadelphia, del.	2.07c to 2.18c
New York, del.	2.14c to 2.19c
Boston, del.	2.265c to 2.415c
Chicago	2.00c
Cleveland, del.	2.04c to 2.09c
Buffalo	2.00c
Bethlehem	2.05c
Birmingham	2.05c
Pacific coast, c.i.f.	2.35c

BARS

SOFT STEEL

Pittsburgh	1.85c to 1.90c
Chicago	2.00c
Birmingham	2.05c
Buffalo	2.00c
San Francisco	2.35c
Cleveland mill	1.85c to 1.90c
Cleveland delivered	1.87½c and 2.09c
Philadelphia delivered	2.17c
New York delivered	2.19c
Boston delivered	2.265c to 2.415c
Pittsburgh, cold finishing	2.00c to 2.05c
Pittsburgh, forging quality	2.10c to 2.15c

RAIL STEEL

Chicago	1.85c
Eastern mills	1.75c

IRON

Chicago	2.00c
New York delivered	2.14c to 2.24c
Philadelphia delivered	2.12c to 2.22c
Pittsburgh, refined	2.75c to 4.25c

REINFORCING

Pittsburgh, billet	1.85c to 1.90c
Chicago, billet	2.30c to 2.75c
Chicago, rail steel	1.85c to 1.95c
Youngstown, billet	1.90c to 2.00c

COLD FINISHED STEEL

Cold finished steel bars, drawn or rolled, Pitts., Chi., c.l.	2.20c
Shafting (turned, polished) Pittsburgh	2.20c
Shafting (turned, ground) mill (Depending on size, 1 3/16 to 7-inch)	2.45c to 2.90c
Cold finished steel bars, Cleve.	2.25c

TIN AND TERNE PLATE

Prices per 100-pound box, Pittsburgh

*Tin plate, coke base	$5.25

Gary, Ind., base 10 cents higher.

Long ternes, primes, No. 24	4.10c

*Prices subject to quantity differentials.

SHEETS

SHEET MILL BLACK

No. 24, Pittsburgh base	2.75c to 2.85c
No. 24, Philadelphia delivered	3.07c to 3.22c
No. 24, Gary, Indiana Harbor	3.00c
No. 24, Chicago, delivered	3.05c
No. 24, Birmingham, base	3.05c

TIN MILL BLACK

No. 28, Pittsburgh, base	2.90c
No. 28, Gary, base	3.00c

GALVANIZED

No. 24, Pitstburgh, base	3.60c to 3.75c
No. 24, Philadelphia, delivered	3.92c to 4.07c
No. 24, Gary, Indiana Harbor	3.85c
No. 24, Chicago, delivered	3.90c
No. 24, Birmingham, base	3.90c

BLUE ANNEALED

No. 10, Pittsburgh base*	1.95c to 2.10c
No. 10, Philadelphia, delivered	2.32c to 2.42c
No. 10, Gary, Indiana Harbor	2.20c
No. 10, Chicago, delivered	2.25c
No. 10. Birmingham, base	2.25c

*Plus 10 cents for 40 inches or wider.

AUTOMOBILE

No. 20, Pittsburgh base	4.00c

IRON

No. 10, Pitts., blue ann., c.l.	2.80c
No. 24, Pitts., box annealed, 1-pass cold rolled, carload	3.75c
No. 24, Pitts., gal., c.l.	4.85c

(Turn to the following page)

Valley, market. Considerably buying of pipe iron is imminent in eastern Pennsylvania. Heavy shipments feature the Chicago and Cleveland markets. Inquiry is expanding at Buffalo. Less than $2.75 has been quoted on standard furnace coke without arousing consumer interest and as low as $2.60 is done on spot material.

Steel bar, plate and shape orders and specifications at Chicago and Pittsburgh contrast with shipments, in the case of bars at Chicago being not over half. Consumption, however, has not tapered off to this extent. Southwestern oil country demand for plates as expressed chiefly in storage tanks has subsided this week. Fabricators in most districts have not received awards warranting heavier taking of plain material. Heavy steel has settled to 1.85c at Pittsburgh, while at Chicago the mills seek to hold at 2.00c.

Sheet Situation Better in Valley

Sheet mill operations in the Mahoning valley have been increased from 75 to 83 per cent this week in response to heavier specifying, while at Pittsburgh some capacity has been taken off. Buying at Chicago and in the East is light. The sheet price situation is spotty, tending toward weakness. Tonnage buyers are shading 2.00c, Pittsburgh, on blue, 2.75c on black and 3.65c on galvanized.

Pittsburgh district makers of hot and cold-rolled strip note a gentle recession in specifications from automotive users. Concessions have developed at Chicago on the wider sizes of hot rolled. Cold bar finishers also have less business from the automotive industry.

The Southern Pacific railroad has closed on 250 automobile cars, the New York Central on 120 coaches and the Illinois Central on 20 suburban cars and trailers. The Erie intends buying 1000 freight and 25 passenger cars. Fifty coaches and as many refrigerator cars comprise the week's new inquiry. The Pennsylvania has distributed large track fastening requirements.

Scrap Firmer as Dealers Cover

All year steel ingot production has been expanding more rapidly than has pig iron, indicating the charging of a larger percentage of scrap in the open hearth furnaces. Now the scrap market is reflecting this condition. Consumers in many districts want heavier shipments of scrap against their contracts and dealers encounter a stiffer market in trying to cover.

Cast iron pipe prices, which have been strengthening, have stood a severe test at Detroit, where 11,980 tons is being bought. Against a foreign bid of $29.08, domestic prices ranged from $30 to $30.75, base, Birmingham, holding at what is considered today's market.

Tin plate mills are receiving better specifications and are in better position than a year ago.

Composite Market Average

Based on Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

This week (April 25, 1928)	**$35.56**
Last week (April 18, 1928)	**35.56**
One month ago (March, 1928)	**35.81**
Three months ago (January, 1928)	**35.27**
One year ago (April, 1927)	**36.73**
Ten years ago (April, 1918)	**56.59**
Fifteen years ago (April, 1913)	**27.74**

Minor price fluctuations have neutralized themselves this week, leaving the IRON TRADE REVIEW composite of fourteen leading iron and steel products unchanged at $35.56. Last month this barometer stood at $35.81.

Current Rolled Steel Prices

PRICES IN CENTS PER POUND UNLESS OTHERWISE INDICATED
SEE ALSO PRECEDING PAGE

HOOPS, BANDS, STRIP

Hot strip, under 3-inch, Pitts, 2.15c to 2.40c
Hot strip, 3 to 6-inch, Pitts. 2.05c to 2.20c
Hot strip, 6 to 12-inch, Pitts. 1.90c to 2.00c
Hot rolled strip, 12 to 24-inch 16 gage and heavier, coils or cut lengths 1.85c plate basis, or 2.00c blue annealed basis.
Hot strip, under 3-in., Chi..... 2.30c to 2.50c
Hot strip, 3 to 6-in., Chi..... 2.20c to 2.30c
Hot strip, 6 to 12-in., Chi..... 2.00c to 2.10c
Hot strip, 12 to 24 in., Chi., 2.10c to 2.20c, blue annealed sheet basis.
Cold rolled strip, hard coils, 1½ inches and wider by 0.100-inch and heavier base, Pitts., Cleve., (over 3 tons) 2.75c to 2.90c
Pitts., Cleve., (1-3 tons)..... 3.00c to 3.15c
Worcester, Mass. 3.05c

ALLOY STEEL

Hot Rolled
F.o.b. Pittsburgh or Cleveland
Alloy Quality Bar Base is 2.65c

S.A.E. Series Number	Alloy differential	Net price 100 lb. bars
2000	0.25	$2.90
2100	0.55	3.20
2300	1.50	4.15
2500	2.25	4.90
3100	0.55	3.20
3200	1.00	3.65
3300	3.80	6.45
3400	3.20	5.85
4100 0.15-0.25 Mo.	0.50	3.15
4100 0.25-0.40 Mo.	0.70	3.35
4600 0.20-0.30 Mo. 1.25-1.75 Ni	1.05	3.70
5100 0.60-0.90 Cr.	0.35	3.00
5100 0.80-1.10 Cr.	0.45	3.10
5100 Chrome Spring	0.20	2.85
6100 Bars	1.20	3.85
6100 Spring Steel	0.95	3.60
Chrome Nickel Vanadium..	1.50	4.15
Carbon Vanadium	0.95	3.60
9250	0.25	2.90

TUBING

BOILER
Carload Discounts—Less-carloads 4 points Lower—F.o.b. Pittsburgh Mills
Steel 3¼ to 3¾-inch 42½
Charcoal iron, 3¼ to 4½-inch 9
Seamless hot rolled 3¼ to 3½-inch 46
Further discounts of five to seven 5 per cents for carloads on lap welded steel. On seamless hot rolled several more 5 per cents, and on charcoal from one 10 per cent to two 10 and one 5 per cents.

COLD DRAWN SEAMLESS
F.o.b. mill in desirable quantities
Random lengths over 5 ft.....55 per cent
Selected lengths, 1 to 18 ft.....53 per cent

WIRE PRODUCTS

To Jobbers in Carloads
F.o.b. Cleveland and Pittsburgh base.
Dealers 5 cents per 100 pounds extra

Bright plain wire, No. 9 gage	2.50c
Annealed fence wire	2.65c
Galvanized wire, No. 9 gage	3.10c
Barbed wire, painted	3.10c
Barbed wire, galvanized	3.35c
	Per 100 lbs.
Wire nails	$2.55 to 2.65
Galvanized nails	4.55 to 4.65
Polished staples	3.00 to 3.10
Galvanized staples	3.25 to 3.35
Coated nails, 100 lb. kegs, Sept. 1, 1926 extras apply	2.55 to 2.65
Woven wire fencing (retailers) 12½ gage, 26-in. high 7-in. bars and 12-in. stays, per 100 rods, f.o.b. Pitts..	$20.08

Joliet, DeKalb and Waukegan, Ill., Anderson, Ind., and Chicago prices $1 per ton over Cleveland-Pittsburgh base on products made there; Duluth $2 higher, Worcester, Mass., and Fairfield, Ala., $3 higher.

CAST IRON WATER PIPE

Prices per net ton
Class B Pipe

Six-inch and over, Birming'm	$30.00 to 31.00
Four-inch, Birmingham	34.00 to 35.00
Four-inch, Chicago	42.20 to 44.20
Six-inch to 24-inch, Chicago....	38.20 to 40.20
Four-inch, New York	40.50 to 41.85
Six-inch and over, New York	37.25 to 38.25
Standard fittings, Bir. base....	$100.00

Six to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $10; 3-inch, plus $20; gas pipe fittings, $5 higher.
Class A pipe is $4 higher than Class B.

IRON AND STEEL PIPE

Base Discounts Pittsburgh and Lorain, O., to Jobbers in Carloads

	Black	Galv.
1 to 3-inch butt steel*	62	50½
1 to 1½-inch butt iron	30	13

Indiana Harbor, Ind., and Evanston, Ill., 2 points less, Chicago del., 2½ points less.
*To large jobbers these discounts are increased on black by 1 point and a supplementary discount of 5 per cent; on galvanized by 1½ points with a supplementary 5 per cent.

CHAIN, PILING, CUT NAILS

Cut nails, c.l., f.o.b. mills....	2.80c
Chain, 1-in. proof coil, Pitts.	6.00c
Sheet piling base, Pittsburgh..	2.25c to 2.35c

RAILS, TRACK MATERIAL

Standard bessemer rails, mill	$43.00
Standard open-h'th rails, mill	$43.00
Relaying rails, St. Louis	$24.00 to 31.00
Relay, rails, Pitts. 60 to 90 lb.	$27.00 to 30.00
Light rails, 25 to 45, mills	$36.00
Angle bars, Chicago base	2.75c
Spikes, railroad, Pittsburgh....	2.80c
Spikes, small railroad, 7/16-inch and smaller, Pitts	2.80c
Spikes, boat and barge, Pitts.	3.00c
Spikes, railroad, Chicago	2.80c
Track bolts, Pitts., stand....	70 off list
Track bolts, Chicago	3.80c
Tie plates, Chicago, Pitts.	$43.00

BOLTS AND NUTS

F.o.b. basing points, Pittsburgh, Cleveland, Birmingham and Chicago.
Discounts are for legitimate jobbing or large consuming trade purchasing in full-case lots, apply to lists of April 1, 1927.
Small lots are 55 to 60 per cent off.

CARRIAGE BOLTS
All sizes, cut thread ..... 70 off
Rolled thread ⅝x6 and smaller take 10 per cent lower list.
Eagle list ..... 70 off

MACHINE BOLTS
All sizes, cut thread ..... 70 off
Rolled thread ⅝x6 and smaller take 10 per cent lower list.
Lag screws ..... 70 off
Plow bolts, Nos. 1-2-3-7 heads ..... 70 off
Tap bolts ..... 70 off
Blank bolts ..... 70 off
Stud bolts without nuts ..... 70 off
Stove bolts, 75, 20, 10 and 5 off in pkgs. 75, 20, 10 and 5 with 2½ off in bulk.
Tire bolts ..... 60-5 off

NUTS
Semifinished ..... 70 off

HEXAGON CAP SCREWS
Milled ..... 80-10-10 off
Upset 1-in. diam. and smaller..... 85-5 off

SQUARE HEAD SET SCREWS
Milled ..... 80-10 off
Upset 1-in. diam and smaller 80-10-10 off

RIVETS

Struct., c.l., Pitts.-Cleve..... 2.90c
Structural, c.l., Chicago..... 3.00c
**7/16-inch and smaller, Pitts...70 and 10 off
Chi., Cleve. .....70 to 70 and 10 off
**Some makers quoting 70 off with freight allowed on 300 pounds or more.

WASHERS

Wrought, c.l., Pitts. dist.....$6.75 off
Wrought, c.l., Chicago dist....$6.70 to 6.90 off
Lock: To dealers .....85-5 off
Lock: To consumers .....85 off

Raw Materials and Semifinished Products

SEMIFINISHED MATERIAL

Prices per gross ton

BILLETS AND BLOOMS
4 x 4-inch base

Pittsburgh, open-hearth	$33.00
Pittsburgh, bessemer	33.00
Youngstown	33.00
Cleveland	33.00
Philadelphia	33.30
Chicago	34.00
Forging, Chicago	39.00 to 43.00
Forging, Pittsburgh	38.00
Forging, Philadelphia	43.30

SHEET BARS

Pittsburgh	34.00
Youngstown	32.50 to 33.00
Cleveland	32.50 to 33.00
Chicago	35.00

SLABS

Pitts., Young., and Cleve.	$33.00

WIRE RODS

Pittsburgh, Cleveland	$44.00
Chicago	45.00

SKELP

All grades, Pittsburgh	1.85c to 1.90c

IRON ORE

LAKE SUPERIOR ORES
Per Gross Ton, Lower Lake Ports

Old range bessemer, 51½%....	$4.55
Mesabi bessemer, 51½%.....	4.40
Old range bessemer, 51½%..	4.40
Mesabi nonbessemer, 51½%....	4.25

EASTERN LOCAL ORES
Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic, 58-63%.....	8.00 to 8.50
Copper free low phosphorus 58 to 65 per cent	nominal

FOREIGN IRON ORE
Cents per unit, alongside docks, Atlantic ports

Foreign manganiferous ore, 45-55% iron, 6-8% manganese	10.00 to 10.50
North African low phosphorus	nominal
Swedish foundry or basic, 65%....	9.00 to 9.50
Spanish and North African basic, 50 to 60 per cent.....	8.50 to 9.00
Newfoundland foundry, 55%....	9.00 to 9.50

MANGANESE ORE

Prices do not include duty of 1 cent per pound of metallic manganese contained.

Brazilian	36 to 38 cents
Indian	36 to 38 cents

Caucasian, 53 to 55 per cent

FLUORSPAR

85 and 5 per cent grade

Washed gravel, Kentucky and Illinois mines, per net ton..	$14.50 to 15.00
Washed gravel, imported duty paid, east. tidewater, net ton	15.00 to 16.00

REFRACTORIES

FIRE CLAY BRICK
Per 1000 f.o.b. works

First Quality

Pennsylvania	$43.00 to 46.00
Ohio	43.00 to 46.00
Illinois	43.00 to 46.00
Kentucky	43.00 to 46.00
Missouri	43.00 to 46.00
Maryland	43.00 to 46.00
Georgia and Alabama	40.00 to 45.00

Second Quality

Pennsylvania	35.00 to 38.00
Ohio	35.00 to 38.00
Illinois	35.00 to 38.00
Kentucky	35.00 to 38.00
Missouri	35.00 to 38.00
Maryland	35.00 to 38.00
Georgia and Alabama	30.00 to 35.00

SILICA BRICK

Pennsylvania	48.00
Joliet, Ill., East Chicago, Ind...	52.00
Birmingham	51.00

MAGNESITE BRICK
Per Net Ton

9 x 4½ x 2½	65.00

MAGNESITE
Net Ton Chester, Pa., and Baltimore base

Dead-burned grain magnesite	40.00

CHROME BRICK
Net Ton Chester, Pa., and Baltimore base

9 x 4½ x 2½	45.00

Pig Iron

Basic Iron Easier—Round Tonnage Placed at Price Indicating Equivalent of $16, Valley—Shipments Good—Melt Increasing at Chicago

A PURCHASE of 3000 to 4000 tons of basic iron by the American Steel Foundries for its Alliance, O., plant, the first real test the basic market has received in some weeks, has resulted in a considerable drop from $17 that has been nominally quoted. The purchase is understood to have been made at $17, or less, delivered. Valley stacks have a freight rate of $1.13 to Alliance, and say $15.87, furnace, was unattractive. The trade understands the order was finally placed with a furnace outside the valley, with lower freight rate, indicating a price equivalent of $16, valley. Some makers now are disposed to meet competition on that basis. The general market is moving along at its recent rate, current orders being small and mainly for fill-in purposes.

PITTSBURGH, April 24.—Single carload sales up to 200 tons at a time constitute most of the activity in pig iron. Although the American Steel Foundries is reported to have closed for 3000 to 4000 tons of basic for its plant at Alliance, O., at $17, delivered, all valley furnace interests deny taking the tonnage, claiming that as they are on a $1.13 freight rate, a furnace price of $15.87 would be uninteresting. The trade here understands the order went to a furnace outside the valley having a much lower freight rate, indicating a basic market of $16, valley. One producer sold three small lots of malleable at $17.25, valley. Several makers are selling small amounts of No. 2 plain on the same basis, higher silicons usually commanding 50-cent differentials. Gray forge iron, usually available at 50 cents under No. 2, cannot be purchased now below $17, and a higher price applied on the last tonnage sold to a pipemaker, the $16.75 figure previously reported proving erroneous. Small lots of bessemer are selling at $17. Basic still is quoted $17, valley.

Boston, April 24.—The Mystic Iron Works booked about 2500 tons of pig iron in the past week for New England. Some of the orders are for third quarter. There has been some buying of eastern Pennsylvania, Buffalo and Alabama iron, mainly in small tonnages, for mixture purposes at prices that ranged above $16.50, base, Buffalo. A few fairly important melters are sounding out the market for third quarter. A Connecticut melter may come into the market for a considerable tonnage in the next fortnight.

New York, April 24.—Orders for more than 8000 tons of pig iron have been placed here the past week. This includes 1500 tons of low phosphorus iron for shipment to the Johnstown, Pa., plant of the Lorain Steel Co. Eastern Malleable Iron Co. has bought more than 1000 tons of malleable for shipment to five plants and is expected to buy at least 1000 tons more. General Electric Co. bought 400 tons of foundry iron for shipment to Schenectady, N. Y. A Brooklyn melter bought 400 tons of foundry iron. A Bridgeport foundry placed 250 tons of foundry iron. Sales included several hundred tons of charcoal iron. Prices on Buffalo iron continues easy. The usual price for shipment to this territory is $16.50, base, furnace, but in certain instances $16 has been done in this territory. Eastern Pennsylvania iron is held at $20, base, furnace. Eastern New York state foundry iron as a rule brings $18, base, furnace, although sold at less in some instances.

Buffalo, April 24.—Pig iron inquiry is larger this week than at any prior time in April. An eastern consumer wants a round tonnage of malleable while a Buffalo melter will buy 1000 tons of foundry iron. A fair number of small lots are pending. Sales during the past week have been more numerous, although limited to small lots. Buffalo furnaces quote $17, base, on local business, and $16 to compete for eastern business.

Pig Iron Prices

Per Gross ton

Bessemer, valley furnace	$17.50
Bessemer, del., Pittsburgh	19.26
Basic, valley furnace	16.00 to 17.00
Basic, del., Pittsburgh	18.13 to 18.76
Basic, Buffalo furnace	17.00
Basic, del., eastern Pa.	19.25 to 20.25
Malleable, valley furnace	17.25
Malleable, del. Pittsburgh	19.01
Malleable, del. Cleveland	18.50
Malleable, Chicago furnace	18.50
Malleable, Buffalo furnace	17.50
Malleable, del. eastern Pa.	20.00 to 21.00
No. 1 foundry, Chicago furnace	19.00
No. 1X, eastern del., Phila.	21.76
No. 1X, Buffalo furnace	18.50
No. 2 foundry, valley furnace	17.25
No. 2 foundry, del., Pittsburgh	19.01
No. 2 fdy., Everett, Mass., fur.	19.00 to 21.00
No. 2 foundry, Buffalo furnace	17.00
No. 2, foundry, Chicago furnace	18.50
No. 2 foundry, Granite City	19.00 to 19.50
No. 2 foundry, Ironton furnace	19.00
No. 2 foundry, del. Cleveland	18.50
No. 2 foundry, del. Phila.	20.76
No. 2 Virginia furnace	20.00 to 20.50
No. 2 foundry, N. J., tidewater	19.78 to 21.76
No. 2 foundry, east N. Y. fur.	18.00
No. 2 Alabama, Birmingham	16.00
No. 2 Alabama, del. Cincinnati	19.69
No. 2 Tenn., Birmingham base	16.00
No. 2 Tenn., del., Cincinnati	19.69
No. 2 Alabama, del. Chicago	22.01
No. 2 Ala., del. Chicago, river-rail	20.18
No. 2 Alabama, del. Cleveland	22.01
No. 2 Alabama, del. St. Louis	20.42
No. 2X, east. N. J., tidewater	20.28 to 21.26
No. 2X, eastern, del. Phila.	21.26
No. 2X, foundry, Buffalo furnace	17.50
No. 2X, eastern, del. Boston	23.15 to 23.65
No. 2X, Virginia furnace	20.50 to 21.00
Gray forge, val., del., Pittsburgh	18.76
Low phos., standard, valley	27.00
Low phos., standard, Phila.	24.76 to 27.29
Low phos. copper bearing fur.	23.00 to 23.50
Charcoal, Birmingham	28.00
Charcoal, Superior, del., Chicago	27.04

Silvery iron, Jackson county (Ohio) furnace in per cents: 5—$22 6—$23; 7—$24; 8—$25; 9—$26; 10—$28; 11—$30; 12—$32; 13—$34.

Bessemer ferrosilicon, Jackson county (Ohio) furnace, in per cents: 10—$30; 11—$32; 12—$34; 13—$36; 14—$38; 15—$40.50; 16—$43.

Cleveland, April 24.—Current sales of pig iron generally are small, furnace interests represented here booking 20,000 tons in the past week, against 18,000 tons in the week preceding. Shipments still are the strong feature of the pig iron situation, melters taking their iron and in some instances increasing their tonnages. The American Steel Foundries is reported to have placed around 3000 tons of basic iron for Alliance, O. Prices of foundry and malleable grades here are steady at $18, base furnace, for local delivery, and $16.75 to $17, base, for outside shipment.

Chicago, April 24.—Buying of spot pig iron for second quarter fill-in continues active, with indications of an increase in the melt in this district. Concerns serving the automotive industry are taking steady shipments. Several additional tonnages have been closed for a part or all of third quarter. The possibility is seen that April shipments may exceed March. The price of $18.50, base, Chicago furnace, is steady for both spot and future shipments. A cargo of boat iron is due here from an eastern lake furnace early next week, but it is believed the aggregate sales of boat iron thus far has been light. St. Louis district iron is being sold by local sellers in central Illinois on the basis of $18.50, Chicago. Concessions of 50 cents a ton are reported in several silvery iron sales in this district.

Cincinnati, April 24.—Pig iron sales are limited to small lots. One company reports its largest sale in the past week was 350 tons. Another reported about 300 tons in carlot or two carlot deliveries. The Williamson Co. inquiry noted last week is reported to have been divided, part going to a southern furnace and the other part to a lake furnace, the total amount of the purchase being 3500 tons.

St. Louis, April 24.—Sales of pig iron continue to make a fair showing. The most encouraging feature is the heavy specifications and large current shipments. The leading blast furnace interest reports shipments for the first three weeks in April the heaviest for any similar period on

(*Concluded on Page* 1101)

Coke

Orders for Furnace and Foundry Fuel of Small Proportions—Low Prices Fail to Attract Buyers

DEMAND for Connellsville beehive coke for blast furnace use is at low ebb, though standard, hand-drawn fuel is offered at $2.60. A valley merchant furnace about to be relighted, and requiring 17,000 tons of coke monthly, will be supplied with by-product coke made in the valley. Medium sulphur heating coke is available at $2.25.

Pittsburgh, April 24.—Since a valley merchant furnace interest, requiring 17,000 tons of coke monthly, will use by-product coke from the Mahoning valley when it lights its furnace in a week or ten days, beehive coke producers are deprived of the only worthwhile tonnage in recent weeks. One beehive operator having a slight surplus made a canvass of blast furnaces and was unable to find any purchaser even though less than $2.75 was quoted. Standard hand-drawn coke is selling spot at $2.60 to $2.85, usually to non-metallurgical interests. Machine drawn coke sometimes is available for less, while medium sulphur heating coke on tracks is quoted at $2.25. Foundry coke demand is slack both as to shipping instructions and new orders. Spot sales usually command $3.75 to $4.25. Premium brands are unchanged at $5.10.

Production of coke in the Connellsville region in the week ended April 14 was 60,850 tons, compared with 72,500 tons in the preceding week, according to the *Connellsville Courier*.

Boston, April 24.—Coke shipments are not increasing, and indications point to little improvement in the immediate future. Mild weather has effected domestic sizes.

New York April 24.—Demand for foundry coke continues dull. Prices on spot beehive foundry coke continue unchanged at $5 to $5.10, f.o.b. Latrobe, Pa., equivalent to $8.71, delivered at Newark and other northern New Jersey consuming points. The market on by-product foundry coke in northern New Jersey continues $8.30, ovens, equivalent to $9 to $9.40, delivered at Newark. The price on by-product coke delivered at most New England consuming points continues $11.

Cincinnati, April 24.—Foundry coke demand has dropped, reports from some producers indicate, although one or two by-product coke manufacturers say their specifications are holding up. Prices are steady.

St. Louis, April 24.—With continued steady improvement in the melt, specifications for metallurgical coke are in good volume, and during the past several days new orders have increased in certain quarters. By-product interests report shipments in April in excess of last April. Prices are unchanged.

Birmingham, Ala., April 24.—Steady production and movement of foundry coke is noted. The foundry grade is quoted at $5, Birmingham, though concessions are reported.

Coke Prices

Beehive Ovens

Prices per Net Ton

Connellsville furnace	$2.60 to 2.75
Connellsville foundry	3.60 to 4.25
New River foundry	7.00 to 8.00
New River furnace	6.00
Wise county, foundry	5.00 to 5.50
Wise county furnace	4.50 to 5.00
Alabama foundry	5.00

By-Product Foundry

Newark, N. J., del.	9.00 to 9.40
Chicago, ovens	9.00
New England, del.	11.00
St. Louis	9.00
Birmingham	5.00
Indianapolis, del.	8.75
Ashland, Ky.	7.00
Portsmouth, O.	7.00
Detroit, ovens	9.00
Buffalo, ovens	850 and 9.50

Ferroalloys

Spiegeleisen Producer Has Good First Quarter—Prices Firm

Pittsburgh, April 24.—Ferroalloy shipments continue high. Occasionally a sale of English ferromanganese is noted, and the $100 price is unchanged. Tonnage of 50 per cent ferrosilicon is fair. The leading producer of spiegeleisen experienced the best first quarter of history in production and shipments. At present it is shipping more than it is making, because some of its customers are taking more than their scheduled tonnage. Contracts for last-half already are being solicited at unchanged prices, $30 to $32, furnace, for 19 to 21 per cent.

Chicago, April 24.—Specifications and shipments on 50 per cent ferrosilicon and ferromanganese are steady. Little activity is shown in spiegeleisen. The price, $32, eastern furnace, for carload lots of 19 to 21 per cent material, is nominal.

Bar Iron Wages Stand

Pittsburgh, April 24.—Bar iron mill wages will remain unchanged in May and June. The average price of bar iron in the preceding two months was 1.85c, according to announcement today by S. C. Leonard, secretary of the Western Bar Iron association. This continues the puddlers' present wages of $11.55 a ton. Following is a comparison of reported sales price averages:

	1928	1927	1926	1925	1924
Jan.-Feb.	1.85c	1.95c	2.00c	2.00c	2.35c
Mar.-Apr.	1.85c	1.95c	2.05c	2.35c	2.35c
May-June	.....	1.95c	2.00c	2.05c	2.25c
July-Aug.	.....	1.95c	2.00c	1.95c	2.15c
Sept.-Oct.	.....	1.90c	2.00c	1.95c	2.10c
Nov.-Dec.	.....	1.85c	2.00c	1.95c	2.05c
Yearly av.	.....	1.90c	2.00c	1.99c	2.21c

Canadian Iron and Steel Output Expands

Toronto, Ont., April 24.—Canada in March produced 78,390 long tons of pig iron compared with 64,691 tons in February and 75,637 tons last March. Basic iron accounted for 67,162 tons of the total, foundry 5151 tons and malleable 6077 tons.

First quarter output of pig iron stood at 208,807 tons or 17 per cent over 178,049 tons in the first quarter of 1927.

March output of ferroalloy was 4629 tons, against 4056 tons in February.

Steel ingots and castings made in March totaled 118,258 tons, against 98,820 tons in February and 107,381 tons last March. For three months the total is 301,373 tons or 32 per cent over the 221,552 tons in the first quarter of 1927.

Postpone Rail Hearing

Washington, April 24.—Hearing of the application of the Pittsburgh, Lisbon & Western railroad for authority to extend its lines to provide the Youngstown, O., district a direct railroad outlet to Ohio river at Smith's Ferry, O., and of the Montour railroad to acquire control of the Pittsburgh, Lisbon & Western, has been postponed from April 26 to May 14. The Pittsburgh Coal Co. owns the Montour railroad.

Ferroalloy Prices

Ferromanganese, 78 to 82 per cent, tidewater, duty paid	$100.00
Ferromanganese, del. Pittsburgh	$104.79
Spiegeleisen, 19 to 21 per cent domestic furnace	32.00
*Ferrosilicon, 50 per cent, freight allowed, carloads	83.50
*Do., less carload	88.50
Do., 75 per cent	130.00 to 150.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. per lb. con., del.	11.00
Do., for spot delivery	11.50
Ferrotungsten, stand., lb. cont.	93.00
Ferrovanadium, 30-40 per cent, per lb., contained, on analysis	3.15 to 3.65
Ferro-carbon-titanium, carload, producers plant, net ton	200.00
Ferrophosphorus, per ton, carload, 17 to 19 per cent, Rockdale, Tenn., basis (18 per cent)	91.00
Ferrophosphorus, electrolytic, per ton, carload, 23-25% f.o.b. Anniston, Ala. (24 per cent)	122.50

*These prices contract; spot $5 higher.

Scrap

Strength Appears as Dealers Seek Material for Contracts—Prices Show Little Change

HEAVY consumption of scrap finally has made its impression. Melters seeking shipments have caused dealers to seek supplies and find higher prices necessary to obtain tonnages. Consumer prices have showed little gain. Consumers' supplies in many instances are not large and sentiment is buoyant.

Chicago, April 24.—Some factors of strength are appearing in the iron and steel scrap market after more than eight weeks of softening prices. Little strength has been manifest in prices paid by consumers, but dealers are eager to cover outstanding orders before contracts expire and are paying higher prices to take what profit they can. Many consumers have depleted their stocks, making dealer position stronger. Few consumers have more than 15 to 20 days' supply in their yards. It is probable also that less scrap is moving in from the outside than in the past four or five weeks. No. 1 wrought is $11.50 to $12, an advance of 50 cents. A consumer purchased a tonnage of the latter at $12. Heavy melting steel is nominal at $12.75 to $13, due to absence of consumer interest. One steelworks consumer is expected to buy soon at $13.

Buffalo, April 24.—Deliveries are being made on recently booked contracts for No. 1 heavy melting steel, entered at prices averaging $14.75, delivered to steelworks. There has been renewed buying of No. 2 steel at $13.

Boston, April 24.—Demand for iron and steel scrap continues good. No. 2 heavy melting steel is active for ship-

Iron and Steel Scrap Prices

Corrected to Tuesday noon. Delivered to Consumers.

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	10.50 to 10.75
Boston, dealers	9.25 to 9.50
Buffalo, No. 1	14.25 to 14.75
Buffalo, No. 2	12.75 to 13.25
Chicago	12.75 to 13.00
Cincinnati, deal.	11.50 to 12.00
Cleveland, No. 1	13.50 to 14.00
Cleveland, No. 2	13.00 to 13.50
Detroit, No. 1	10.75 to 11.50
Eastern, Pa.	13.50 to 14.00
Eastern Pa., No. 2	10.50 to 11.50
Bethlehem delivery	13.50 to 14.00
N. Y., deal., R. R.	10.00 to 10.85
N. Y., deal., R. R. yd.	7.00
Pittsburgh, No. 1	15.00 to 16.00
St. Louis	11.00 to 11.50
Valleys, No. 1	14.25 to 14.75

COMPRESSED SHEETS

Buffalo	12.75 to 13.25
Chicago	10.75 to 11.25
Cleveland	12.50 to 12.75
Detroit	10.75 to 11.00
Pittsburgh	15.00 to 15.50
Valleys	14.00 to 14.50

BUNDLED SHEETS

Buffalo	10.00 to 10.50
Cincinnati, deal.	9.50 to 10.00
Cleveland	11.50 to 12.00
Eastern Pa.	10.50
Pittsburgh	14.00 to 14.50
St. Louis	7.75 to 8.25

SHEET CLIPPINGS, LOOSE

Chicago	7.50 to 8.00
Cincinnati	8.75 to 9.25
Detroit	7.00 to 7.50
St. Louis	7.50 to 8.00

STEEL RAILS, SHORT

Birmingham	11.50 to 12.00
Boston	8.50 to 9.00
Buffalo	15.75 to 16.25
Chicago	15.25 to 15.75
Cincinnati, deal.	16.00 to 16.50
Detroit	11.00 to 11.50
St. Louis	15.50 to 16.00

STOVE PLATE

Birmingham	13.00 to 14.00
Boston, consumers	10.00
Buffalo	12.75 to 13.25
Chicago, net	11.50 to 12.00
Cinn., deal., net	8.50 to 9.00
Cleveland	12.00 to 12.50
Detroit, net	10.50 to 11.00
Eastern Pa.	12.00
N. Y., deal., mill.	7.50 to 8.00
Pittsburgh	12.50 to 12.75
St. Louis	12.00 to 12.50

SHOVELING STEEL

Chicago	12.75 to 13.00
Pittsburgh	10.50 to 11.00
St. Louis	11.00 to 11.50

KNUCKLES, COUPLERS SPRINGS

Buffalo	15.50 to 16.00
Chicago	14.00 to 14.50
Eastern Pa.	16.00 to 16.50
Pittsburgh	16.50 to 17.00
St. Louis	12.75 to 13.25

LOW PHOSPHORUS

Buffalo, billet and bloom crops	16.75 to 17.25
Cincinnati, deal.	13.00 to 13.50
Eastern Pa.	17.50 to 18.50
Pitts. billet and bloom crops	18.50 to 19.00
Cleve. billet and bloom crops	17.00 to 17.50

FROGS, SWITCHES, GUARDS

Chicago	13.50 to 14.00
St. Louis	12.00 to 12.50

ANGLE BARS—STEEL

Buffalo	14.00 to 14.50
Chicago	14.00 to 14.50
St. Louis	11.50 to 12.00

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	11.00 to 12.00
Boston, dealers	9.50 to 10.00
Buffalo, No. 1	12.25 to 12.75
Buffalo, No. 2	14.25 to 14.75
Chicago, No. 1	12.90 to 13.45
Chicago, No. 2	12.75 to 13.00
Cinn., No. 1 deal.	10.50 to 11.00
Eastern Pa.	15.00 to 15.50
N. Y., No. 1 deal.	11.00 to 11.50
Pittsburgh, No. 1	11.00 to 11.50
Pittsburgh, No. 2	15.00 to 16.00
St. Louis, No. 1	9.50 to 10.00
St. Louis, No. 2	11.25 to 13.75

WROUGHT PIPE

Boston, dealers	7.75 to 8.25
Eastern Pa.	12.50
Buffalo	12.00 to 12.50
New York, deal.	8.00 to 8.50

YARD WROUGHT

Boston	8.00 to 8.50
Eastern Pa.	14.50 to 15.00

BUSHELING

Buffalo	12.75 to 13.25
Chicago, No. 1	10.50 to 11.00
Chicago, No. 2	8.50 to 9.00
Cinn., No. 1 deal.	10.50 to 11.00
Cinn., No. 2	6.50 to 7.00
Cleveland, No. 2	10.00 to 10.25
Pittsburgh, No. 1	12.00 to 12.50
St. Louis, No. 1	9.50 to 10.00
Detroit, mixed	7.25 to 7.50

MACHINE SHOP TURNINGS

Birmingham	8.00 to 9.00
Boston	5.50 to 5.75
Buffalo	8.50 to 9.00
Chicago	7.00 to 7.50
Cincinnati, deal.	7.50 to 8.00
Cleveland	7.25 to 7.50
Detroit	6.00 to 6.50
Eastern Pa.	10.00 to 10.50
New York, deal.	6.25 to 7.35
Pittsburgh	10.00 to 10.50
St. Louis	7.00 to 7.50

MIXED BORINGS, TURNINGS
For blast furnace use

Boston, dealers	5.75 to 6.00
Buffalo	9.50 to 10.00
Cincinnati, deal.	8.25 to 8.75
Cleveland	10.00 to 10.25
Detroit	6.75 to 7.00
Eastern Pa.	10.50 to 11.00
New York, deal.	6.75 to 7.35
Pittsburgh	10.50 to 11.00

CAST IRON BORINGS

Birmingham, chem.	13.00 to 13.50
Birmingham, plain	8.00 to 9.00
Boston, chem.	9.50 to 10.00
Boston, dealers	6.00 to 6.50
Buffalo	9.75 to 10.25
Chicago	9.25 to 9.50
Cincinnati, deal.	8.25 to 8.75
Cleveland	10.00 to 10.25
Detroit	6.75 to 7.00
Eastern Pa.	10.50 to 11.00
Eastern Pa., chem.	14.50 to 15.00
New York, deal.	6.75 to 7.35
Pittsburgh	10.75 to 11.25
St. Louis	8.75 to 9.25
Valleys	13.50

PIPES AND FLUES

Chicago, net	8.50 to 9.00
Cincinnati, deal.	7.75 to 8.25
St. Louis	9.00 to 9.50

RAILROAD GRATE BARS

Buffalo	11.50 to 12.00
Chicago, net	11.50 to 12.00
Cleveland	12.00 to 12.50
Eastern Pa.	11.50 to 12.00
New York, deal.	8.00 to 8.50
St. Louis	11.00 to 11.50

FORGE FLASHINGS

Boston, deal.	6.75 to 7.25
Buffalo	12.00 to 12.50
Chicago	9.50 to 10.00
Cleve., over 10 in.	12.25 to 12.50
Detroit	9.50 to 10.00
Pittsburgh	13.00 to 13.50

FORGE SCRAP

Boston, deal.	6.00 to 6.50
Chicago	15.50 to 16.00
Eastern Pa.	11.00 to 11.50

ARCH BARS AND TRANSOMS

Chicago, net	18.50 to 19.00
St. Louis	19.50 to 20.00

Iron, Steel Works Scrap

AXLE TURNINGS

Boston, deal.	6.75 to 7.00
Buffalo	12.50 to 13.00
Chicago	10.25 to 10.75
Cleveland	12.00 to 12.25
Eastern Pa.	12.00 to 12.50
Pittsburgh	13.00 to 13.50
St. Louis	9.50 to 10.00

STEEL CAR AXLES

Birmingham	16.00 to 17.00
Boston, ship. point	15.50 to 16.00
Buffalo	16.75 to 17.25
Chicago	17.65 to 18.20
Cleveland	16.00 to 16.50
Eastern Pa.	21.00 to 22.00
Pittsburgh	18.50 to 19.00
St. Louis	18.00 to 18.50

SHAFTING

Boston, ship. point	13.00 to 13.50
Chicago	17.35 to 17.90
Eastern Pa.	17.50 to 18.00
New York, deal.	14.00 to 14.50
St. Louis	16.50 to 17.00

Iron Foundry Scrap

CAR WHEELS

Birmingham, iron	14.00 to 15.00
Boston, con.	14.00 to 14.50
Buffalo, iron	13.25 to 13.75
Buffalo, steel	15.50 to 16.00
Chicago, iron	13.50 to 14.00
Chi., rolled steel	15.00 to 15.50
Cincinnati	12.25 to 12.75
Eastern Pa.	16.00
N. Y., iron, deal.	11.50 to 12.00
Pittsburgh, iron	14.50 to 15.00
Pittsburgh, steel	16.50 to 17.00
St. Louis, iron	12.75 to 13.25
St. Louis, steel	13.25 to 13.75

No. 1 CAST SCRAP

Birmingham, cup.	14.00 to 14.50
Boston	14.00 to 14.50
Buffalo	14.50 to 15.00
Chicago, machiny.	15.65 to 16.25
Chicago, railroad.	14.30 to 14.85
Chicago, agri.	14.00 to 14.55
Cincinnati, mach. cupola, net deal.	14.50 to 15.00
Cleveland, cupola.	16.50 to 17.00
Detroit, net	12.25 to 12.75
Eastern Pa. cupola	16.00 to 16.50
N. Y., cup., deal.	13.00 to 13.50
Pittsburgh, cupola	14.50 to 15.00
San Fran., del.	20.00 to 21.00
Seattle	15.50 to 15.75
St. Louis, railroad	13.00 to 13.50
St. Louis, agri.	13.00 to 13.50
St. Louis, machy.	13.00 to 13.50
Valleys	16.50 to 17.00

HEAVY CAST

Boston	10.50 to 11.00
Buffalo, breakable	11.50 to 12.00
Cleve., breakable	12.25 to 12.50
Detroit, auto., net	20.00 to 21.00
Detroit mach., net	12.25 to 12.75
Eastern Pa.	15.50 to 16.00
New York, deal.	11.50 to 12.00
Pittsburgh	12.50 to 13.00

MALLEABLE

Boston, railroad	13.00 to 13.50
Buffalo	15.00 to 15.50
Chicago, agri.	11.75 to 12.25
Chicago, railroad	12.75 to 13.00
Cinn., R. R., deal.	12.50 to 13.00
Cinn., agri., deal.	12.25 to 12.75
Cleveland, agri.	15.00 to 15.50
Cleveland, rail.	15.50 to 16.00
Detroit, auto	14.50 to 15.00
Pittsburgh, rail.	15.00 to 15.50
St. Louis, agri.	11.50 to 12.00
St. Louis, rail.	11.50 to 12.00

Miscellaneous Scrap

RAILS FOR ROLLING
5 feet and over

Birmingham	13.00 to 13.50
Boston, dealers	9.75 to 10.00
Buffalo	14.50 to 15.00
Chicago	14.00 to 14.50
Eastern Pa.	15.25 to 15.50
New York	11.00 to 11.50
Pittsburgh district	16.50 to 17.00
St. Louis	13.00 to 13.50

LOCOMOTIVE TIRES

Chicago, No. 1	14.00 to 14.50
Chicago, cut	16.00 to 16.50
St. Louis, No. 1	12.00 to 12.50

LOW PHOS. PUNCHINGS

Chicago	14.00 to 14.50
Pittsburgh	16.50 to 17.00

ment to Pittsburgh and for export to Danzig, about 15,000 tons in three shiploads being sent there. Textile and machinery cast has gone to Pennsylvania at $14 to $14.50, delivered. For No. 1 heavy melting steel for Pennsylvania delivery $9.50 has been paid, though most dealers offer $9.25.

New York, April 24.—Buying by dealers against back contracts comprises most trading in scrap. Little fresh consuming demand is noted. Meanwhile, prices continue steady. Some fair-sized tonnages have been offered by consumers at 50 cents or so under previous prices, but evidently no business has been placed at these figures.

Philadelphia, April 24.—Market for iron and steel scrap is slightly easier. Knuckles and couplers now can be had at $16, after sales at $16.50. Considerable stove plate has been bought at $12 and buyers now are offering $11.50 but without getting any. Sales of several lots of turnings include one of 500 tons at $10.50, delivered, which is 50 cents off.

Bethlehem Steel Co. again has withdrawn its Sparrows Point plant from the scrap market. This plant after having been out of the scrap market for nearly a year took about 25,000 tons of No. 1 heavy melting steel and the gates now are closed.

Pittsburgh, April 24.—Traders in the scrap market are between two fires. Interests with scrap on order have been calling for expedited deliveries. Short interests have paid high figures for suitable grades. On the other hand, while those who are holding scrap quote as high as $16 upon it dealers are uninterested because their customers are willing to pay only $14.50 to $15. In the meantime, heavy melting steel is $15 to $16. No. 2 busheling has sold at $9 to $9.50, or at a $3 differential under No. 1.

The Pennsylvania railroad's scrap list offered for bids by May 2 covers an aggregate of 42,558, plus an auxiliary list of 3220 tons.

Cleveland, April 24.—Iron and steel scrap prices fail to strengthen, reflecting continued regulation of shipments, despite fairly well sustained consumption. No. 1 heavy melting steel is reported slightly stronger in the Valley, but no sales above $14.25 to $14.75 have been noted. The $13.50 to $14 range prevails on No. 1 grade in this market. More scrap is moving here from Detroit by boat.

Cincinnati, April 24.—Carload and similar small tonnages cover most of the trading in iron and steel scrap. Prices are unchanged. A steel mill in this district has covered requirements for some time.

St. Louis, April 24.—Iron and steel scrap in this market has taken a slight turn for the better. Price declines have halted, some fractional advances are recorded and the general tone has improved. For the first time in a long while some inquiry has appeared.

Birmingham, Ala., April 24.—Plenty of iron and steel scrap is obtainable and requirements of melters are being met promptly. Quotations are unchanged, though considered firm. Heavy melting steel is held at $10.75.

Semifinished

Specifications Show Good Consuming Rate—Wire Rods $42 in Eastern Market

SPECIFICATIONS for sheet bars, billets and slabs continue active, in accordance with strip mill operations which average 75 to 80 per cent, sheet mills 80 per cent and tin mills 90 per cent. Users are covered for second quarter and current buying is light, at unchanged prices. Wire rods are being sold in the eastern market at $42, base, Pittsburgh.

SEMIFINISHED STEEL PRICES, PAGE 1086

Pittsburgh, April 24.—Specifications for semifinished steel are active, but new buying is light. Strip mill operations average 75 to 80 per cent, sheet mills around 80 per cent, and tin mills 90 per cent or higher, so consumption is relatively high. Prices are unchanged at $33 for billets and slabs, $38 for forging billets and $34 for sheet bars. Wire rods have not moved liberally against $44 contracts as yet, buyers having managed to gather in tonnage last month on lower bases. Skelp at 1.85c to 1.90c is quiet. Recently some shipments were made to Canada on contracts.

New York, April 24.—On sales of wire rods in this district the past week $42, base, Pittsburgh, has been done. This figure indicates the market here. The $44 price apparently has disappeared.

Philadelphia, April 24.—Wire rod contracts in most instances have been modified from $44 to $42, base, Pittsburgh. Small billet sales are being made at unchanged prices.

Cleveland, April 24.—The leading manufacturer of sheet bars, billets and slabs continues to operate 13 of its 14 open hearths. Specifications are good. Current prices are $33, Cleveland or Youngstown, for sheet bars, billets and slabs, although most business has been covered by contract for second quarter.

Chicago, April 24.—Specifications for billets and sheet bars continue at the same rate as in first quarter. Sales of billets are in carload to 300-ton lots. Forging billets are $39 to $43, Chicago, according to grade. Billets, 4 x 4-inch base, are $34, Chicago. Sheet bars continue in active demand, but buying for forward shipment is less active. The price is $35, Chicago.

Bolts, Nuts, Rivets

Specifications Hold Volume and Deliveries Are Steady

NUT AND BOLT PRICES, PAGE 1086

Chicago, April 24.—Specifications for bolts, nuts and rivets are holding to the level of the past two months despite a slight decline in the size of specifications from farm implement works. Automotive buying still continues heavy. Jobber stocks are low generally and specifications from the jobbing trade usually are in small lots. Distributors report they are obtaining 60 to 65 off for odd lots of bolts. The quotation of 70 and 10 off applies on most orders for small rivets.

Pittsburgh, April 24.—While rivet shipments this month are fairly heavy in first quarter contracts at 2.75c, a fair volume of business has already been done on 2.90c second quarter contracts. Rivet makers are operating at 50 to 60 per cent, and nut and bolt makers 60 to 70. The latter products are quoted at 70 off. Orders are only fair, with occasional spot market transactions noted involving single carloads.

Cleveland, April 24.—Specifications for bolts, nuts and rivets are well maintained. April sales give indication of exceeding March. Operations average about 65 per cent. Firm prices are reported.

Iron Ore

Market Is Fairly Active—Large Tonnage Closed in Open Market

IRON ORE PRICES, PAGE 1086

Cleveland, April 24.—Lake Superior iron ore producers continue to book good size tonnages in the open market at last year's prices. One steelworks interest is negotiating for close to 500,000 tons, and may place this order this week. Some consumers that previously placed their basic requirements now are coming into the market for special grades. It is estimated that about 2,000,000 tons will be closed in the open market this spring. Users also are signifying their requirements on term contracts, which indicates to some producers that the season's shipments will be slightly larger than last year.

The Lake Superior Iron Ore association gives the following details concerning consumption of ore in March, and tonnage on hand:

	Tons
Ore consumed in February	4,394,931
Ore consumed in March	4,808,075
Increase in March	413,144
Ore consumed in March, 1927	5,031,196
Ore at furnaces April 1, 1928	18,690,656
Ore on Lake Erie docks April 1, 1928	5,568,098
Total at furnaces and Lake Erie docks April 1, 1928	24,258,754
Total April 1, 1927	24,808,525

The Market Section

Bars

Heavy Production and Shipments but Current Sales Relatively Light—Prices Steady

PRODUCTION of soft steel bars continues to lead other sections, Chicago mills being at 90 per cent and Pittsburgh 75 per cent of capacity. Heavy specification against first quarter contracts limits present activity but shipments continue high and material is going into consumption. Prices are based on 1.85c, Pittsburgh, and 2.00c, Chicago.

BAR PRICES, PAGE 1085

Chicago, April 24.—Specifications for bar mill products are at the high mark of the first quarter, but contract sales for delivery after first half are in less volume. Current business is centered largely in specifications, now that second quarter obligations are booked. Buying is reported mostly in one to three carload lots, the total volume of sales being 40 to 50 per cent under shipments, it is estimated. Specifications are holding up well. Shipments are at the rate of the finished steel output. Bar mill operations are fully 90 per cent. Bar sales average higher than sales of shapes and plates. Cold finishers, automotive parts and farm implement operations are at the high mark of the first quarter. Implement schedules for May call for shipments of finished steel at the same rate as April, but bookings for the period after May are scant. Sales to warehouses for nearby shipment are reported heavier.

Lots of one to five carloads of soft steel bars are commanding 2.00c, Chicago. Some evidence is seen of the widening circle of preferred buying, but one producer reports a contract sale of as much as 9000 tons at 2.00c. Buyers are inclined to barter for 1.95c when attractive tonnages of eight to ten carloads are offered.

Rail steel bar mills operations of both Chicago Heights mills are at the top mark. Rail steel fence post business is taking on more activity. The price is holding at 1.85c, Chicago Heights. Bar iron is steady at 2.00c, Chicago.

New York, April 24.—Steel bar makers are gratified at demand. Current bookings are not as heavy as during March, when the trade was laying in stocks at prices expiring March 31. Current demand is heavier than was expected. The price usually is 1.85c, base, Pittsburgh, equivalent to 2.19c, delivered New York.

Pittsburgh, April 24.—Merchant steel bar makers keep up fairly high operating schedules, about 75 per cent. Delivery averages a week or 10 days, although on certain popular sizes three weeks' dating prevails. Jobbers' demands are not heavy at present since all have good stocks. Cold finished bar producers' specifications have fallen off during the past 10 days. The market is firm at 1.85c, both spot and contract. Some buyers are able to develop that price on miscellaneous carloads made up of mixed sizes and shapes.

Refined iron bar demand at best is spasmodic. Small orders prevail and buying does not protrude far into the future. Prices start at 2.75c.

Philadelphia, April 24.—Steel bar specifications are much better than expected in view of the heavy releases against first quarter contracts in March. Current consumption is good. Prices range from 1.85c to 1.90c, Pittsburgh.

Cleveland, April 24.—April soft steel bar sales will show a noticeable recession from March, especially in the heavier sizes which run up tonnage. Automotive demand continues to lead. Consumption has not declined to the extent fresh buying has. Local makers ask 1.85c, Cleveland, and other mills 1.85c, Pittsburgh, with 1.90c on small business.

Steel Stacks In and Out at Chicago

Chicago, April 24.—Twenty-nine of the 36 steelworks blast furnaces in the district are in operation, and the steelworks operating rate is strong at 95 per cent. For several days 30 furnaces were in operation. Illinois Steel Co. blew in the eleventh of its 12 stacks at Gary, April 20, but is blowing out No. 5 for relining, leaving the net total unchanged. Both the furnace blown in and the one taken out for repairs are of the same capacity. Rail and bar mill operations are fully 90 per cent.

Princess Iron Corp. Sold

Philadelphia, April 24.—W. W. Zimmerman, Clifton Forge, Va., has purchased the Princess Iron Corp. properties at receivers' sale for a bid of $21,850. This is subject to court approval.

Plates

Specifications Fair, New Orders Moderate—Users Still Obtaining Tonnage on Low Price Contracts

PLATE specifications are fair, while new orders are light. Car builders, oil tank fabricators and the building industry in the Middle West are taking tonnages at about the same rate as in March. Specifications in some other districts are meager owing to the large quantities taken on lower price contracts at the close of the first quarter. Single carloads are bringing 1.90c.

PLATE PRICES, PAGE 1085

Chicago, April 24.—Specifications for plates are coming from car building shops, building industry and oil tank fabricators at the rate of the past several weeks, although contract sales for second quarter shipment are light. Miscellaneous manufacturing specifications are reported at 4000 to 5000 tons for the week. One mill has booked about 2000 tons of tank plates for southwestern oil fields, and another mill about 1500 tons. Universal plate shipments are lengthened to about 30 days. Two to three weeks' deliveries can be made on sheared plates. Plate mill operations are close to 90 per cent. Mills obtain 2.00c, Chicago, for sales to miscellaneous manufacturing lines, but weakness is shown in the Southwest where competition is heavy for a small amount of oil tank work.

New York, April 24.—Plate bookings continue fair. About 75 per cent of demand is being supplied on first quarter contracts. The rest of the business is being taken at prices ranging from 1.85c to 1.90c, base, Pittsburgh, or 2.00c to 2.05c, base Coatesville, depending on destination. At New York the current market is 2.175c to 2.225c delivered. The Erie railroad has included a carfloat and a tug boat, to ply in New York harbor, in its budget for the coming year.

Pittsburgh, April 24.—Plate users buying single carloads find it difficult to do less than 1.90c. Contract buyers are specifying meagerly at present on 1.85c arrangements, owing to the heavy tonnages accepted in March against lower price contracts. Small scattered tanks and stand pipe jobs require 20 to 100 tons and inquiries develop every day or two. A few barge inquiries are out, the largest requiring about 600 tons for the Mississippi river commission. The Dravo Contracting Co. was low bidder on ten gasoline hoist barges for the New York Central railroad, but no formal

award has come through. The Atlantic Coast Channel System Co. was low bidder on five scows for this railroad, but no award has been made.

Philadelphia, April 24.—Plate demand is well maintained, consumption proceeding at a good rate. Eastern mills are operating at 60 to 70 per cent. The price is 2.00c to 2.05c, base, Coatesville, for Philadelphia delivery.

Cleveland, April 24.—Lima Locomotive works is figuring on 35 engines for the Erie railroad, for which a fair amount of plates would be required. Tank builders have ordered sparingly. April sales run well below those of March. Plates are 1.85c, Pittsburgh, with 1.90c on occasional small lots.

CONTRACTS PLACED

318 tons, 80,000-barrel tank, American Oil Co., Curtis Bay, Md., to Riter-Conley Co.
307 tons, 16 and 18-inch welded pipe, Ontario, Calif., to Los Angeles Mfg. Co.
100 tons, 60-inch riveted pipe for filtration plant, Sacramento, Calif., to Western Pipe & Steel Co.
Unstated tonnage, seven carfloats and one steam lighter, to American Brown Boveri Electric Corp., two tugboat hulls to Pusey & Jones Co.

CONTRACTS PENDING

3500 tons, six 250-foot car floats for Pennsylvania railroad, eastern delivery; Dravo Contracting Co. low bidder.
2500 tons, ten gasoline hoist barges, New York Central railroad; Dravo Contracting Co. low bidder.
600 tons, five 120 x 30 x 7-foot sand and gravel barges for Mississippi river commission, Memphis, Tenn.; bids close May 1.
650 tons, dredger and two scows, harbor commission, San Francisco; bids in May 9.
500 tons, five scows for New York Central railroad; Atlantic Coast Channel System Co. low bidder.
200 tons, stand pipe for United States government at Fort Benning, Ga.; bids close May 4.
200 tons, two 15-ton steel hull snag barges, for United States engineers, Memphis, Tenn.; bids close April 30.
125 tons, one 30-ton steel hull steam-driven, stern-wheel snag boat, for United States engineers, Memphis, Tenn.; bids close April 30.

Finishing Operations in Valley Higher

Youngstown, O., April 24.—While finishing mill operations in this district have gained slightly, to around 80 per cent, ingot operations dropped off to 39 active open-hearth furnaces out of 53 independent units, against 41 last week. Carnegie Steel activities are around 80 per cent for the entire district. Out of 127 independent sheet units 106 are active this week, against 95 last week. Strip mills are at 100 per cent, and independent bar mills at 50 to 60, with the leading maker at 75.

Gary Art Auctioned

Paintings, porcelains, books, tapestries and other collections of the late E. H. Gary, chairman of the United States Steel Corp. have been auctioned at New York. A painting by Gainsborough brought $360,000 and set a new high record for American auctions. The 39 paintings offered commanded $1,154,650.

Pipe

Mill Operations Continue About 60 Per Cent—Cast Pipe Prices Withstand Severe Test

MISCELLANEOUS line pipe business and shipments by mills against jobbers orders, under the 30-day period of coverage following recent price advances, are holding mill operations around 60 per cent. Cast pipe prices withstood a severe test in the past week when 11,980 tons at Detroit received a low bid of $29.08, Birmingham from French interests and $30 to $30.75 by domestic.

PIPE PRICES, PAGE 1086

Pittsburgh, April 24.—Pipe tonnage in general is increasing although gas and oil lines occupy a place in the background. A number of inquiries for large lots of line pipe still are pending while occasional small lots are booked and small inquiries are more frequent. This, with betterment in jobber demand for full weight merchant pipe, is holding up mill operations to 60 per cent. Some increased tonnage coming to pipe mills is attributed to extra buying prior to the recent removal of a preferential 5 per cent discount to jobbers. The trade here understands some interference has come from a competitor of the Knorpp interests which proposed to lay a gas line from Amarillo, Tex., to Kansas City, Kans. This will require over 100,000 tons of 22 and 24-inch pipe and while reports persist that this tonnage has been informally awarded a Milwaukee maker, confirmation is not obtainable. One or two other inquiries for large lots of line pipe are tentatively up.

Boston, April 24.—The only two municipal lettings up for the present week consist of two contracts amounting to approximately 100 tons each. Private business continues in good proportion. The market seems to be firmer, although concessions still can be had on the larger sizes, 16 inches and up. Belief is that prices will continue to work upward.

New York, April 24.—Cast pipe demand continues slack. This applies particularly to public work. Few municipal projects of size are active. No action has yet been taken on the 2600 tons for the local department of water supply, gas and electricity. But it appears likely that the business will go as indicated by the bids reported last week.

Cleveland, April 24.—Mills are shipping pipe to jobbers at a fair rate, filling in schedules on orders placed under the month-quota allowance before the recent elimination of a 5 per cent preferential discount April 1. A new resale card to harmonize with the advance has been issued by leading jobbers.

Chicago, April 24.—Strength of the market in cast iron water pipe was disclosed in the tabulation of bids by the Detroit waterworks department for 11,980 tons of 24, 30 and 36-inch class C pipe. French pipe sellers submitted the lowest bid of $29.08, base, Birmingham, but this covered only 3500 tons of the order. Domestic sellers' bids ranged from $30 to $30.75, base, Birmingham. Because of the foreign competition that is sometimes involved, Detroit offerings usually bring out the lowest prices that the market will bear. Bids in this instance indicate that sellers are determined on a more stable price situation. Milwaukee will receive bids soon on 3000 tons of 24 and 48-inch pipe. Contract business is coming in with steady volume. It is indicated that the price of $30 to $32, Chicago, for 6 to 24-inch pipe, is holding.

Birmingham, Ala., April 24.—Production of cast iron pressure pipe has improved somewhat with shipments picking up also. Quotations are stronger, and $30 to $31 per ton on 6-inch and over sizes are being maintained. Despite considerable business on hand and in sight, pipe makers are buying pig iron only for a few weeks' needs.

CONTRACTS PLACED

275 tons, 2 to 10-inch class 150, Livingston, Calif., through Robt. McNair to unstated maker.
225 tons, 6 to 12-inch pipe by Victoria, B. C., to Leith, Murray & Co., Ltd., who will furnish Bavarian pipe.
200 tons, fittings for Chicago, to National Cast Iron Pipe Co.
100 tons, cast pipe, Newburgh, N. Y., to Warren Foundry & Pipe Corp.
Unstated tonnage, 2685 feet, 16-inch water pipe, Shorewood, Milwaukee county, Wis., through Ralph E. Loeb Inc., to unstated maker.

CONTRACTS PENDING

11,980 tons, 24, 30 and 36-inch, class C pipe, for Detroit; B. Nicoll & Co., bid $35.57, delivered, on 1000 tons, of 24-inch, 1057 tons of 30-inch and 1500 tons, of 36-inch; American Cast Iron Pipe Co., $38 on 1000 tons of 24-inch; National Cast Iron Pipe Co., $38.25 on 750 tons of 24-inch; James B. Clow & Sons, $38.35 on 1000 tons of 24-inch, $38.90 on 500 tons of 30-inch, and $39.50 on 300 tons of 36-inch; United States Cast Iron Pipe & Foundry Co., $38.65 on the entire lot of 5159 tons of 24-inch, 1057 tons of 30-inch and 5764 tons of 36-inch.
8744 tons, 4 to 30-inch class B, Long Beach, Calif.; United States Cast Iron Pipe & Foundry Co. low.
3000 tons, 24 and 48-inch pipe for Milwaukee; bids received soon.
1799 tons, 30 and 36-inch class B, Venice out-

fall sewer, Los Angeles; bids in May 7.
500 tons, 6 and 8-inch pipe for Royal Oak, Mich.; bids in.
200 tons, special fittings for Chicago; bids in soon.
155 tons, cast pipe and manhole covers for New York; Donaldson Iron Co. low bidder.
152 tons, 2 to 8-inch class B, Camas, Wash.; bids in April 30.
108 tons, 62 tons, 54-inch straight, 46 tons, 36 and 54-inch lugged straight pipe, and 22.3 tons bids received and new quotations will be ad- 36 and 54-inch special castings, Milwaukee; no vertised for.
100 tons, 6-inch pipe, East Bridgewater, Mass.; bids in. April 30.
100 tons, 6 to 8-inch pipe, Salem, Mass.; bids in.
Unstated tonnage, 19 miles of 6 and 8-inch pipe for St. Clair Shores, Mich.; bids opened May 1.
Unstated tonnage, estimated as large quantity, two pipe jobs for Bronx, N. Y.; general contractors' bids to be taken May 1.

Sheets

Market Is Spotty—Valley Operations Increase Slightly—Specifications Fair

SPOTTY conditions are noted in the sheet market, with prices stronger in some districts than in others, and operations also varying in different localities. While specifications have shown a dragging tendency in the Pittsburgh district, those coming to valley mills have increased, checking the downward tendency in operations. Buying in general is slacker than in recent weeks.

SHEET PRICES, PAGE 1085

Youngstown, O., April 24.—The downward trend in independent sheet mill operations in the valleys has been checked, the rate yesterday being higher than in some weeks. They began the week yesterday at 83 per cent, against 75 last week. Specifications are more liberal. More strength appears in autobody sheets and tin mill black than other grades. The former are 4.00c, Pittsburgh, and the latter 2.90c. Blue annealed sheets appear a close third, due to a fair volume of new business in scattered lots. The usual price is 1.95c to 2.05c. The common black and galvanized markets still are uncertain. Most black makers refuse to go below 2.75c, although 2.70c has been reported, but not confirmed, and even lower rumored in adjoining districts. Galvanized ranges from 3.65c to 3.75c. Demand is moderate.

Buffalo, April 24.—Demand for black and full finished sheets continues sufficient to indicate continued operation of Buffalo mills at 85 per cent for the rest of this quarter.

New York, April 24.—Softness in prices of sheets made some consumers hesitate in coming into the market. In the last few days, however, new blue annealed business has been placed and shows 2.10c, base, Pittsburgh, has withstood attempts to obtain concessions. The indications are that 2.00c is not much of a factor in the market. However, the $2 per ton extra on blue annealed on widths over 40 inches has been ignored in some instances. Galvanized sheets usually are 3.65c, base, Pittsburgh, but in some instances 3.60c has been done. In black sheets 2.75c, base, Pittsburgh, is the usual price with some concessions on attractive business. Consumption continues good.

Pittsburgh, April 24.—Specifications flow steadily to sheet mills from diversified industries. Some have experienced a slight letdown in the rate as compared with March. Many mills are unable to map out their operating schedules more than a week in advance. Attractive tonnages are being taken by automotive and allied industries, although shipments to such users appear to have reached their peak and in some cases to have passed it. Agricultural implement makers continue to use large amounts, and 1928 promises to exceed 1927, the record year for that class of users. Instead of increasing with spring as is usual, tonnage for building construction appears to be falling off. Prices generally are unsatisfactory. Some makers are offering prices below 2.10c, 2.90c and 3.75c on blue annealed, black and galvanized, respectively. Operations average 80 per cent.

Philadelphia, April 24.—Some weak spots are noted in blue annealed sheets, but the market is fairly firm at 2.10c, base, Pittsburgh, most mills refusing to do less. Galvanized sheets are easy at 3.65c to 3.75c, Pittsburgh, and black 2.75c, with 2.70c done occasionally. Specifications are fair. Eastern sheet mills are operating at 65 to 75 per cent.

Cleveland, April 24.—No further weakening in sheet prices is noted. Most business placed on mill books consisted of releases on contract tonnage. Black sheets are quoted at 2.90c, Pittsburgh, with 2.80c the minimum named by several makers to meet competition. Blue annealed holds 2.10c for small lots, but 2.00c is more common. Galvanized is fairly uniform at 3.65c, although 3.75c is quoted. Autobody remains 4.00c and metal furniture stock 3.75c to 3.95c. Pressure of automotive manufacturers to enable their parts makers to obtain minimum prices is contributing to the weakness.

Chicago, April 24.—Weakness has developed in steel sheet prices in the Southwest in Indianapolis territory. Mills are lacking backlogs in this district but a fair amount of specifications appear for nearby shipment, particularly in blue annealed sheets. For business closed in the Chicago territory and for shipments in Chicago freight rate markets, Gary and Indiana Harbor prices are holding at 3.00c for No. 24 black, 3.85c for No. 24 galvanized, and 2.20c to 2.30c for No. 10 blue annealed.

St. Louis, April 24.—Sheet specifications since April 1 have exceeded expectations, and the leading local producer reports full operations in all departments excepting galvanizing. Purchasing by the general manufacturing trade is brisk.

The interstate commerce commission has found the freight rate on steel billets, in carloads, from Masillon, O., to Syracuse, N. Y., unreasonable but not unduly prejudicial or preferential.

Tin Plate

Specifications Exceeding Those of 1927 —New Buying Is Limited

TIN PLATE PRICES, PAGE 1085

Pittsburgh, April 24.—Specifications on tin plate for general line and packers' cans are ahead of last year, the position of tin plate producers, canmakers and packers being far more favorable than at this time in 1927. The specifications keep coming in steadily, but no new buying is noted. Except for departures by those producers never are able to obtain the full market, tin plate is $5.25, base. American Sheet & Tin Plate Co. continues this week on a 92 per cent operating basis. Independents are operating 90 to 95 per cent.

Pittsburgh Steel Rate Tapers Slightly

Pittsburgh, April 24.—Some of the larger steelmakers hold at 85 per cent, but the average for this district has dropped to 80. Some open hearths have been taken off at Steubenville and Portsmouth, O., Wheeling, W. Va., and Midland, Pa. At Monessen, Pa., nine out of 12 are operating and at Butler, Pa., five out of ten. Works at Weirton, W. Va., and Vandergrift, Pa., still are practically full. Tin plate production is at 90 per cent, sheets 80 to 85, strips 70 to 75, cold finished bars 60 to 70, wire 50 and nuts, bolts and rivets 60.

Institute Announces New Capacity Figures

The American Iron and Steel institute has completed its survey of annual capacities for pig iron, steel ingots and steel castings and has announced the following figures as of Dec. 31, 1927: Pig iron, 49,808,320 gross tons; steel ingots, 59,435,766 gross tons; and steel castings, 2,029,334 gross tons. These tonnages include pig iron and steel made by all processes. The corresponding figures as of Dec. 31 1926, were as follows: Pig iron, 51,681,000 gross tons; steel ingots, 57,999,171 gross tons; and steel castings, 2,033,076 gross tons.

Structural Shapes

Cooper Bridge Award of 12,000 Tons Tops Week's Contracting—Heavy Pending Lots Remain Active—Prices Steady

STRUCTURAL steel activity of the past week was featured by the closing of 12,000 tons for the Cooper river bridge of Charleston, S. C., the contracts being awarded McClintic-Marshall Co. and Virginia Bridge & Iron Co. Awarding of the general contract for the Renlex building in New York, specifications requiring 17,000 tons, indicates early action on the steel. Few other structural inquiries or awards were developed during the week.

Plain structural material prices continue steady with 1.85c, Pittsburgh, and 2.00c, Chicago, quoted on new business. The bulk of shipments represents tonnage covered at first quarter prices on which contracts were extended. Fabricated quotations remain weak in large consuming districts.

STRUCTURAL SHAPE PRICES, PAGE 1085

New York, April 24.—Except for the placing of 12,000 tons for the Cooper river bridge at Charleston, S. C., structural awards have been relatively light. This is particularly true with regard to the local market, with fabricators competing keenly for business. Fabricated material prices continue at extremely low levels. Little buying against second quarter prices has developed. Much of the present tonnage is against contracts extended at first quarter prices for early specification. A good volume of new business is in prospect.

Boston, April 24.—Other than some awards for bridges damaged or swept away by the floods in New Hampshire last fall, the week was inactive in the structural market.

Philadelphia, April 24.—Structural shape demand was somewhat less in the past week but specifications generally in April exceeded the March rate. Prices on plain material are about the same average as prevailed during the first quarter. Fabricated shape lettings are slow in developing.

Pittsburgh, April 24.—Fabricators still encounter keen competition on every job that comes up for figuring. Awards this week are slim although a number are fast approaching the place where action of some sort must necessarily be taken. The bids on a grandstand and club house at Wilkinsburg, Pa., were considered too high, hence were thrown out. New plans are being prepared for early bidding. Plain material is firm at 1.85c and some non-contracting customers have had to pay 1.90c for small lots.

Cleveland, April 24.—Specifications for plain structural material are being received by mills in fair quantities, but new buying is practically nonexistant. Specific fabricated work in this territory consists mostly of prospects although several fairly large lots are definitely pending. Plain material prices continue 1.85c, Pittsburgh, with 1.90c on small lots.

Chicago, April 24.—Specifications are holding well on plain structural shapes and are coming largely from the building steel fabricators and the car building shops. Structural mill operations are at a top mark. Practically all buying is for prompt delivery. These sales run in lighter individual volume than bar sales. Fresh structural inquiry has fallen off since the bunching of awards at the close of the first quarter. Mills are quoting 2.00c, Chicago, for all new business which is largely in lots of several carloads. Buyers negotiate for a lower price where attractive tonnages are offered.

Awards Compared

	Tons
Awards this week	30,409
Awards last week	29,505
Awards two weeks ago	32,862
Awards this week in 1927	25,782
Average weekly awards, March	30,805
Average weeky awards, 1928	41,577
Total awards to date, 1927	630,856
Total awards to date, 1928	665,236

CONTRACTS PLACED

12,000 tons, Cooper river bridge, Charleston, S. C., 8000 tons to McClintic-Marshall Co. and 4000 tons to Virginia Bridge & Iron Co.

6000 tons, southern approach, municipal free bridge, St. Louis, fabrication to American Bridge Co. on bid of $78.75 a ton, delivered, and erection to Ben Hur Erection Co., on bid of $18.40 a ton.

2495 tons, involved in following awards:
- 3-story school, 238 East 105th street, New York.
- 4-story warehouse, Sixth avenue, between Fiftieth and Fifty-first streets, New York, both going to Hay Foundry & Iron Works.
- Flatbush boys' club, 2241 Bedford avenue, Brooklyn, N. Y.
- Unstated building in New York, both going to Hedden Iron Construction Co.
- Building for Brooklyn Savings bank, Clinton and Pierpont streets, Brooklyn, N. Y., to Post & McCord.
- Mid-day club, 25 Broad street, New York, to A. E. Norton.

2000 tons, highway bridge over Missouri river at St. Joseph, Mo., to Mt. Vernon Bridge Co.

700 tons, court house at Des Moines, Iowa, to Des Moines Steel Co.

625 tons, loft building, 253 West Twenty-seventh street, New York, reported awarded unstated fabricator.

606 tons, bridge over Sacramento river at Freeport, Calif., to Moore Drydock Co.

570 tons, church, Wilshire boulevard and Berendo street, Los Angeles, to Union Iron Works.

408 tons, hangar, for government, San Diego, Calif., to McClintic-Marshall Co.

405 tons, apartment, 417 East Fifty-first street, New York, to Easton Structural Steel Co.

400 tons, Masonic temple, Glendale, Calif., to Baker Iron Works.

400 tons, Irene Kaufman settlement house addition, Center avenue, Pittsburgh, to American Bridge Co.

400 tons, St. Elizabeth hospital, Youngstown, to Truscon Steel Co.

300 tons, bridge for Bangor & Aroostook railroad, Monticello, Me., to Bethlehem Steel Co. Previously noted awarded unstated fabricator.

255 tons, temporary board of trade building, Chicago, to Wendnagel & Co.

250 tons, building for Patterson Foundry & Machine Co., East Liverpool, O., to independent fabricator.

240 tons, umbrella sheds, Los Angeles, to McClintic-Marshall Co.

227 tons, two new bridges at Littleton, N. H., to American Bridge Co.

210 tons, sewage disposal plant, High Point, N. C., through Tucker & Laxton, to O. Z. Wrenn & Co.

200 tons, state highway bridge in Michigan, to Massillon Bridge & Structural Co.

155 tons, building for Dupont Rayon Co., Buffalo, to Jones & Laughlin Steel Corp.

150 tons, including steel for armory, Findlay, O., to Massillon Bridge & Structupral Co.

150 tons, high school, Lock Haven, Pa., to Jones & Laughlin Steel Corp.

150 tons, plates and shapes, bins and conveyer supports, Findlay Lime Products Co., Akron, O., to Pittsburgh-Des Moines Steel Co.

150 tons, high school, Bridgeport, Conn., to American Bridge Co.

145 tons, apartment, Twentieth and Irving streets, San Francisco, to McClintic-Marshall Co.

144 tons, three bridges at Bethlehem, Lisbon and Wentworth, N. H., to American Bridge Co.

130 tons, crane runway addition for plant of Calaveras Cement Co., San Andreas, Calif., to McClintic-Marshall Co.

125 tons, lock gates for dam No. 6, Allegheny river, to Heyl & Patterson Inc.

110 tons, garage building for Weingartner Realty Co., New Castle, Pa., to American Bridge Co.

109 tons, addition to Liver Bros. Co. plant and railroad trestle for Dorchester Coal Co., Dorchester, Mass., to A. O. Wilson Structural Co.

100 tons, building for Bowman Dairy Co., Highland Park, Ill., to Midland Structural Co.

100 tons, store at 1041 Market street, San Francisco, to Golden Gate Iron Works.

100 tons, building for East Pittsburgh Savings & Trust Co., East Pittsburgh, Pa., through Miller Construction Co., general contractor, to John Eichleay Jr. Co.

100 tons, warehouse for Upson-Walton Co. on Elmwood avenue, Cleveland, to Austin Co. for fabrication and engineering.

100 tons, structural work for Chicago, Burlington & Quincy railroad, to Midland Structural Steel Co.

Unstated tonnage, Gordon Battelle laboratory, Columbus, O., reported awarded to International Derrick & Equipment Co.

CONTRACTS PENDING

17,000 tons, Renlex building, Lexington avenue and Forty-second street, New York; general contract awarded to Schroder & Koppel.

3800 tons, 13-story film building, Ninth avenue between Forty-fourth and Forty-fifth streets,

New York.
2800 tons, store building for Robert Simpson Co. Ltd., Toronto, Ont.; Chapman & Oxley, that city, general contractors.
2000 tons, Northwestern Mutual Life Insurance building, Milwaukee.
1850 tons, Kanawha Valley bank and office building, Charleston, W. Va.; general contract awarded James Stewart Co., New York.
1600 tons, 16-story loft, 227 East Forty-fifth street, New York.
1400 tons, lift span bridge, Wilmington, Del.; bids asked.
1000 tons, St. Peter's hospital, Albany, N. Y.
1000 tons, highway bridges, Vermont.
947 tons, bridge over San Joaquin river at Herndon, Calif.; bids opened.
700 tons, approximate, highway bridges in New York state; bids in.
700 tons, savings bank, Wilkes-Barre, Pa.
680 tons, store on Fourth street, Long Beach, Calif.; bids being received.
600 tons, bridge over Smith river, Del Norte county, Calif.; Park-Schramm Co. of Portland, Oreg., awarded general contract.
500 tons, warehouse, Baltimore.
500 tons, casino, Asbury Park, N. J.
470 tons, apartment, 5930 Franklin street, Los Angeles; bids being received.
450 tons, building for New York Dock Co., Brooklyn, N. Y.
400 tons, Reuss building, Philadelphia; general contract to Wark Co.
380 tons, warehouse at foot of Fourteenth street, Oakland, Calif.; bids in April 23.
300 tons, 4-story loft, 206 Fulton street, New York; bids asked.
250 tons, apartment, Kenmore and Wilshire boulevard, Los Angeles; bids being received.
250 tons, garage alterations, Mt. Vernon, N. Y.
235 tons, store in Hollywood, Calif.; bids being received.
200 tons, St. James church, Lakewood, Cleveland.
166 tons, market, Ninth and San Pedro streets, Los Angeles; bids being received.
130 tons, grandstand and club house, Wilkinsburg, Pa.; bids rejected, plans being revised for new building.
127 tons, Baptist church, Cleveland; bids in.
125 tons, state bridge, New Jersey.
100 tons, 2-story building for Clarence Carlin, 1938 Euclid avenue, Cleveland; Walker & Weeks, that city, architects.
100 tons, approximate, addition to Archealogical museum, Ohio State university, Columbus, O.; R. H. Evans low bidder on general contract.
100 tons, approximate, shipping building for Bucyrus-Erie Co., Erie, Pa.; Henry Schenk & Co. awarded general contract.
Unstated tonnage, bank, West Englewood, N. J.
Unstated tonnage, school, Media, Pa.
Unstated tonnage, school, Eleventh and Thompson streets, Philadelphia.
Unstated tonnage, Carpenter apartment, Philadelphia.
Unstated tonnage, office building, Prospect avenue and Fourth street, Mt. Vernon, N. Y.
Unstated tonnage, building for Milwaukee Gas Light Co., Milwaukee.
Unstated tonnage, office building for First Wisconsin National Bank building, Milwaukee.
Unstated tonnage, extensive alterations, Joseph Horne Co. store, Pittsburgh; bids about to be asked.
Unstated tonnage, Essen-Charles street bridge over East street, Northside, Pittsburgh, for city and county; bids to be asked about June 1.
Unstated tonnage, freight house and other buildings, Pennsylvania railroad, Eleventh to Thirteenth street, Pittsburgh; bids about to be asked.
Unstated tonnage, 5-story top addition to Rose building, Cleveland; general contract to George A. Rutherford Co., William R. Powell, architect.
Unstated tonnage, high level bridge over Black river, Lorain, O.; bids to be taken about May 1 by F. L. Ellensberger, clerk, Lorain county commissioners; C. T. Biggs, Elyria, O., engineer.

Edmonds is Advanced

J. H. Edmonds, formerly assistant manager of the Lebanon, Pa., plant of the Bethlehem Steel Co., has been appointed general manager, succeeding John Penn Brock, whose death was announced in IRON TRADE REVIEW, issue of April 12. J. A. Kinney has been appointed assistant manager, succeeding Mr. Edmonds.

Concrete Bars

Demand Continues Heavy in Peak Season—Roadbuilding Requirements Heavy

CONCRETE reinforcing bar activity is marked by the usual heavy tonnages placed for spring construction. Roadbuilding demands are beginning to materialize in heavy inquiries and awards. Between 2500 and 3000 tons is pending in the Pittsburgh district for building work. Rail steel bar sales are running 30 to 35 per cent ahead of 1927 at Chicago.

REINFORCING BAR PRICES, PAGE 1085

Pittsburgh, April 24.—Between 2500 and 3000 tons is the estimated total of concrete bars involved in pending work. Inquiry keeps up remarkably well and promises to grow although the general complaint among fabricators is that owners are slow about closing. The majority of inquiries are small, but several attractive ones are out taking between 200 and 500 tons apiece. The market price of new billet bars is firm at 1.85c to 1.90c.

Boston, April 24.—Conditions develop but little change for concrete bars and reinforcing steel. Small lots of 10 to 50 tons are quite abundant. Work on road construction has started actively, resulting in the placing of a fairly good tonnage for road mesh. Connecticut this week placed 1000 tons with American Steel & Wire Co., and 300 tons with Concrete Steel Co. The price averages about $80 a ton. It is expected 400 tons more will be placed soon. This tonnage will go into the first 20 to 30 miles of what is expected to be a 200-mile project. New Hampshire is expected to place about 300 tons of road mesh in the next few days for rebuilding of roads damaged by floods.

Buffalo, April 24.—Brisk competition continues for the large amount of reinforcing bar and welded mesh tonnage pending for spring and summer delivery. Prices as low as 2.00c, Buffalo, are being quoted on choice tonnage with truck delivery lots selling up to 2.75c. Steelworks producing reinforcing bars are stocked up in anticipation of a large volume of rush shipment business in the near future.

Cleveland, April 24.—Call for bids on approximately 1000 tons for Cleveland Union Terminal foundation work features the concrete bar market. Inquiries and awards mostly involve lots of 50 tons or less. Demand is lighter than normal for the season. New billet bar prices continue 1.85c, Pittsburgh, with Cleveland mill quotations of 1.85c subject to shading for attractive tonnages. Rail steel holds at 1.75c, mill.

Chicago, April 24.—Rail steel reinforcing bar sales are estimated to be 30 to 35 per cent above last year. Billet bar buying is slightly above first quarter last year. Several large projects are being figured. Occasional shading is reported in billet bars when attractive tonnages come in, but the range quoted is 2.30c to 2.75c. Rail steel bars are steady at 1.85c to 1.95c, Chicago, for the bulk of business.

Awards Compared

	Tons
Awards this week	10,590
Awards last week	14,658
Awards two weeks ago	6,438
Awards this week in 1927	5,905
Average weekly awards, March	7,761
Average weekly awards, 1928	8,024
Total awards to date, 1927	83,271
Total awards to date, 1928	128,386

CONTRACTS PLACED

4500 tons, fourth unit of Chicago sewage treatment works at Stickney, Ill., to Olney J. Dean & Co., previously reported to unstated fabricator.
2000 tons, Bon Marche department store building, Seattle, divided between Northwest Steel Rolling Mills and Pacific Coast Steel Co.
1600 tons, addition to Soldiers' field grandstands, Chicago, to Olney J. Dean & Co.
1300 tons, mesh and bars, highway work in Connecticut, 1000 tons to American Steel & Wire Co., 300 tons to Concrete Steel Co.
1220 tons, drainage district No. 23, Los Angeles, to unnamed interest, in addition to 5257 tons placed as announced last week.
800 tons, billet steel, approach to Crawford avenue bridge, Chicago, to Underground Construction Co., which will purchase bars from several fabricators.
700 tons, rail steel, apartment on South side, Chicago, to Inland Steel Co.
550 tons, Woolworth building, Chicago, to unstated fabricator.
500 tons, section 1 route 108, Queensboro subway, New York, to Truscon Steel Co., through Corson Construction Co.
300 tons, building for Sears, Roebuck & Co., at Milwaukee, to American System of Reinforcing.
250 tons, road work in Lucerne county, Pennsylvania, through Georges Construction Co., to Truscon Steel Co.
250 tons, school, Belgrade and Ann streets, Philadelphia, to Truscon Steel Co.
250 tons, rail steel, road work, Illinois, to Calumet Steel Co.
170 tons, billet steel, temporary board of trade building, Chicago, to unstated fabricator.
150 tons, road work in New York state, to Truscon Steel Co.
150 tons, road work in Indiana county, Pennsylvania, through Rankin Construction Co., 50 tons, and in Erie county route 761, 100 tons, to Truscon Steel Co.
100 tons, apartment house, Seneca and Summit streets, Seattle, to Pacific Coast Steel Co.
100 tons, paving state road No. 1, Whatcom county, Wash., to Northwest Steel Rolling Mills.
100 tons, grain elevator, New Westminster, B. C., to Northwest Steel Rolling Mills.

100 tons, store for Santa Fe railroad at Richmond, Calif., to Gunn, Carle & Co.
100 tons, Taylor school, San Francisco, to Pacific Coast Steel Co.

CONTRACTS PENDING

1000 tons, store building for Robert Simpson Co. Ltd., Toronto, Ont.; Chapman & Oxley, that city, general contractors.
1000 tons, bridge over Lake Champlain, Vt., award expected about May 8.
1000 tons, foundation work for Cleveland Union Terminals Co., Cleveland, medical arts, mercantile and garage buildings; bids in April 27.
400 tons, mesh and bars, highway work in Connecticut; award expected shortly.
360 tons, postoffice garage with retaining wall, Pittsburgh; bids being compiled.
300 tons, mesh and bars, highway work in New Hampshire; award expected shortly.
250 tons, Sewickley Valley hospital, Sewickiey, Pa; bids close May 7.
250 tons, apartment house, Webster Groves, St. Louis county, Mo.
225 tons, Kanawha Valley bank and office building, Charleston, W. Va.; general contract awarded James Stewart Co., New York.
220 tons, high school and stadium, Buffalo; bids being compiled.
200 tons, school athletic field, Buffalo; George Schaaf, low bidder.
135 tons, building for Miller Saw Trimmer Co., Pittsburgh; bids beign compiled.
116 tons, building for Packard Motor Co., Pittsburgh; Rust Engineering Co. general contractor.
100 tons, new building of Whitesides Paper Co., St. Louis.
100 tons, Faulkner hospital, Jamaica Plain, Mass.
100 tons, Oakmont, Pa., sanitarium; bids being compiled.

Republic Official Lineup Radically Changed

Following election of Elmer T. McCleary as president of the Republic Iron & Steel Co. and Harry T. Gilbert as vice president in charge of sales, last week, Messrs. McCleary and Gilbert and John T. Harrington, president of the Trumbull Steel Co., have been elected to the board of directors. They succeed Thomas J. Bray, retiring president, William T. Graham, and Crispin Oglebay.

The newly chosen executive committee of the Republic company now comprises Messrs. McCleary and Harrington, Youngstown, O.; Cyrus S. Eaton, and George M. Humphrey, Cleveland, and John A. Topping, New York.

The revised official lineup of the Republic company now is: Chairman, John A. Topping; president, Elmer T. McCleary; vice presidents, Harry L. Rownd and Harry T. Gilbert, and treasurer, John U. Anderson, succeeding Herman Hurd.

Further changes in operating and sales departments are expected, especially when the Trumbull properties are absorbed.

Tool Dealers To Meet

Associated Machine Tool Dealers will conduct its annual spring meeting at Granville, O., May 23-25, it has just been announced. E. P. Essley, 551 West Washington boulevard, Chicago, is secretary of the organization.

One-tenth of the tin plate entering the world's markets at present is of German production.

Rails, Cars

Roads Press for Rail Deliveries —New York Central Orders 120 Passenger Cars

PRESSURE of railroads for deliveries is maintaining 90 per cent operations in Chicago district mills, with a continuance of this rate for 60 days expected. Western mills will supply about 10,000 tons of the Pennsylvania track fastening order. New York Central has closed on 120 passenger cars and the Erie railroad has indicated that it may purchase 1000 freight cars.

RAILROAD TRACK PRICES, PAGE 1086

Chicago, April 24.—Railroads are pressing for shipment of standard steel rails purchased in the primary 1928 buying movement, and rail mill operations in the Chicago district are holding to 90 per cent to keep up with this demand. Operations at that rate appear to be assured for at least the next 60 days. About 3500 to 4000 tons of rails were ordered during the week by several of the smaller roads in lots of 500 to 1000 tons. Only a few miscellaneous orders are on inquiry now. Scattered sales of light rails are reported. About 9000 to 10,000 tons of the Pennsylvania's track fastenings order was placed with western mills. Only a few miscellaneous lots of track fastenings were booked by mills in this territory. Track fastenings inquiry is lighter than usual. Current inquiry includes one lot of 2000 tons of track bolts for a Western road. It is understood that Chicago & Eastern Illinois will build the 500 box cars in its own shops that it has on inquiry.

New York, April 24.—Featuring the eastern car market is the placing of 120 miscellaneous passenger cars by the New York Central. This is the second largest order of this description to have been placed in the East in many months. Freight car buying by eastern railroads continues light. Erie railroad has announced its intention of purchasing 1000 box cars and also 25 passenger coaches, but no indication has been made as to when the inquiry will be issued.

Pittsburgh, April 24.—An exceptionally quiet market prevails in light rails and accessories are not much more active. Buyers in the West Virginia territory where coal mine operations are more extensive apparently are buying rerolled rails. Billet-rolled rails are selling at $36.

Track accessory shipments are fairly heavy against contracts, but no new business is developing and no large inquiries are out. The 2.80c price is steady for spikes. An occasional carload is sold to street railway companies whose needs are greater at this season of the year than at any other.

CAR ORDERS PLACED

Cudahy Packing Co., Cudahy, Wis., 100 underframes, to Pullman Car & Mfg. Corp.
Delaware, Lackawanna & Western, one baggage-mail car, to American Car & Foundry Co.
Fruit Growers Express, 400 underframes, to Pacific Car & Foundry Co.
Illinois Central, ten suburban cars and ten trailers, to Pullman Car & Mfg. Corp.
New York Central, 120 miscellaneous passenger cars, awarded as follows: Twenty-five, including 14 coaches, six dining cars and five horse cars, to Pullman Car & Mfg. Corp.; 26, including ten baggage, ten coach, three baggage and mail and three passenger and baggage, to Standard Steel Car Co.; 34, including 20 baggage and 14 horse cars, to American Car & Foundry Co.; five coaches to Pressed Steel Car Co., and 30 milk cars to the Merchants Despatch, the company's own shops.
Pennsylvania Salt Mfg. Co., Philadelphia, two tank cars, to General American Tank Car Corp.
Southern Pacific, 250 automobile cars, to Tennessee Coal, Iron & Railroad Co.

LOCOMOTIVE ORDERS PLACED

Chicago & North Western, eight locomotives, to Baldwin Locomotive Works.
Chicago, St. Paul, Minneapolis & Omaha, eight switch engines, to Baldwin Locomotive Works.
Southern Pacific, three locomotives, to Baldwin Locomotive Works.

CAR ORDERS PENDING

Barrett Co., 100 insulator tank cars.
Chicago, Rock Island & Pacific, 500 box car underframes.
Detroit, Toledo & Ironton, four coaches.
Erie railroad, 1000 box cars, and 25 steel passenger coaches, steel baggage and mail, express and dining cars, just announced as contemplated for purchase in connection with improvement program for this year.
North American Car Co., 50 express refrigerator cars.
Southern Pacific, 46 miscellaneous coaches.

LOCOMOTIVE ORDERS PENDING

Canadian Pacific, 25 locomotives; bids asked.
Cleveland Union Terminals Co., twenty-five 150-ton electric locomotives; delivery before Jan. 30, 1930, specified.
Erie railroad, 35 freight locomotives, contemplated for purchase this year.

Seeks Tungsten Costs

Washington, April 24.—A resolution has been introduced by Senator Oddie of Nevada asking for an investigation by the tariff commission of the comparative production costs of tungsten in this country and China.

Freight rates on structural steel, in carloads, from Birmingham, Ala., to Eagle Pass., Tex., for export have been upheld by the interstate commerce commission.

Wire

Northwest More Active in Taking Farm Wire—Nails Continue Weak Spot in Market

JOBBERS are not taking heavy shipments of wire and nails, as most have considerable stocks bought at lower first quarter prices. Manufacturers are specifying against second quarter contracts. Nails lack strength and some shading continues to be done. Most sellers are seeking to maintain $2.65, Pittsburgh, on nails. Production is about 50 per cent.

WIRE PRICES, PAGE 1086

Pittsburgh, April 24.—Wire shipments are heavy. Specifications by manufacturers are liberal against second quarter contracts. Barbed wire and fencing activity is fair, shipments being lower this month than last. Mixed carload orders for wire products from jobbers, including various kinds of nails, are scarce, most jobbers being supplied with stocks at lower bases last month or during first quarter. While in some instances a $2.55 nail base has been extended into this month, most sellers are trying to maintain $2.65 with the new extras. Wire mill operations and shipments are on the basis of 50 per cent.

New York, April 24.—The market on plain steel wire for manufacturing purposes continues firm here at 2.50c, base, Pittsburgh, and consistently good demand is reported. Recent concessions in wire nails, down to $2.55, base, Pittsburgh, have resulted in certain makers meeting this price. But on the whole, the usual figure on nails continues $2.65.

Philadelphia, April 24.—Wire prices continue firm here at 2.50c, base, Pittsburgh. Some cutting of $2.65 per 100-pound keg is being done on wire nails, but principal makers all are refusing to do lower in most cases.

Cleveland, April 24.—Although $2.55, Cleveland, per 100-pound keg of wire nails has not disappeared in southern and western parts of the state, nail manufacturers selling the Cleveland district find $2.65, the open market quotation, easy to obtain. Jobbers are paying the full price except where covered with long term contracts at concessions. Plain wire is 2.50c, Cleveland, for delivery here. Lower prices from Indiana mills have not disappeared.

Chicago, April 24.—A more active market for wire products is developing in the Northwest. Sales in Missouri river territory reflect adverse spring weather. Nails continue the weak spot. Woven wire fencing and barbed wire are showing good activity. Some concessions are reported in the price of wire nails, with quotations at $2.65 to $2.70. Bright plain wire is 2.55c, Chicago or Western mills.

$1,162,251 to Surplus

Pittsburgh, April 24.—First quarter earnings of the Jones & Laughlin Steel Corp. after expenses and taxes, were $4,325,204. After depreciation, depletion and bond interest, net income was $2,903,457. Less dividends, the balance carried to surplus was $1,162,251.

Strip Steel

Wide Hot Rolled Shaded Somewhat, With Narrow Sizes Steady

STRIP PRICES, PAGE 1086

Chicago, April 24.—Easier prices are quoted in instances in wider sizes of hot rolled strip steel, but quotations for narrower widths are steady, since local producers have booked through May at present prices. For hot strip, 12 to 24 inches, as low as 2.10c, blue annealed sheet basis, has been made. Producers are seeking to hold the 2.20c blue annealed basis on wide strips. Mills are sold into the first ten days of May on 12-inch strip and wider. Inasmuch as producers are sold up for 30 days on the narrower sizes, it is reported no contracts will be rewritten for lower quotations.

Cold rolled strip prices here are based on the Pittsburgh-Cleveland quotation of 2.90c, despite reports of 2.75c, Pittsburgh-Cleveland, in the Detroit district.

Pittsburgh, April 24.—Between 75 and 90 per cent of business in cold rolled strip steel carries 3.15c base. Larger tonnages for automotive and allied industries carry 3.00c base (2.75c for three tons or more). Strip manufacturers are operating at 70 to 75 per cent. Hot strip orders have been fairly frequent although tonnages are small. Prominent shippers insist 1.90c is their lowest for any width or gage. Others who cater to consumers utilizing narrow material are able to obtain as high as 2.20c. April tonnage is somewhat below that of March.

Cleveland, April 24.—Specifications for hot and cold-rolled strip are lighter. Small widths continue in fairly good demand, with one mill quoting July delivery. For less than 3-inch, 2.20c, Pittsburgh, applies for hot strip, 2.40c practically having disappeared from the market. For 3 to 6-inch size 2.10c is difficult to obtain, and on 6 to 12-inch sizes, the open market price of 1.90c, Pittsburgh, is weak. Mills continue to ship tonnage against contracts which have run over from the first quarter, and 1.80c has become more representative. Cold finished strip holds at 2.90c, Cleveland, for lots over 3 tons, for small orders, but shading has developed down to 2.80c.

Cold Finished Steel

Automotive Demand Less But Other Users Buy Well

COLD FINISHED PRICES, PAGE 1085

Pittsburgh, April 24.—While automotive tonnage appears to be falling off somewhat in cold finished bars, screw machine products industries and other miscellaneous consumers maintain a fair demand. Operating schedules are at 60 to 70 per cent. A fair advance has been made against second quarter contracts, even though tonnage collected by users in March was comparatively heavy. The market is 2.20c. Jobber demand is only moderate.

Would Increase Institute Directors by 6

At the annual business meeting of members of the American Iron and Steel institute at New York, May 7, a proposal to increase the number of directors from 24 to 30 will be considered. Another change in the constitution of the institute would remove "first, second and third" from the description of vice presidents and prescribe the election of one or more. The president also would be made ex officio a member of all standing committees but not chairman thereof, as at present.

This meeting is not to be confused with the spring meeting of the institute, May 25.

March Exports, Imports Trend Upward

Washington, April 24.—March iron and steel exports and imports increased substantially over February, statistics of the department of commerce show. Exports totaled 221,935 tons in March compared with 185,915 tons in February and 171,094 tons in March, 1927. Imports were 74,127 tons in March compared with 47,628 tons in February and 61,872 tons last March. Scrap was the principal product exported, totaling 26,510 tons, with boiler tubes and welded pipe at 23,214 tons and coming second. Structural shapes stood highest among imports, reaching 17,131 tons. Pig iron imports aggregated 16,155 tons.

Tri-City Technical council has arranged for a joint meeting of all local technical organization at the LeClaire hotel, Moline, Ill., April 30. Dr. Harrison E. Howe, editor of *Industrial and Engineering Chemistry*, will speak on "The New Competition."

Nonferrous Metals

Price Fluctuations Are Extremely Narrow—Current Buying Is Limited but Lack of New Demand Is Offset by Large Shipments

Prices of the Week, Cents a Pound

	Copper			Straits Tin			Lead		Zinc	98-99%	Spot	Ingot
	Electro delivered	Lake delivered	Casting refinery	New York Spot	New York June	New York	East St. Louis	St. Louis	Aluminum	Antimony	Nickel
April 18	14.22½	14.35	13.90	52.50	52.12½	6.10	6.00	5.75	23.90	10.12½	35.00
April 19	14.22½	14.35	13.90	52.25	52.00	6.10	6.00	5.75	23.90	10.00	35.00
April 20	14.22½	14.35	13.90	52.25	52.00	6.10	6.00	5.77½	23.90	10.12½	35.00
April 23	14.22½	14.35	13.90	51.87½	51.75	6.10	6.00	5.80	23.90	10.00	35.00
April 24	14.25	14.35	13.90	52.25	52.12½	6.10	6.00	5.82½	23.90	10.00	35.00

NEW YORK, April 24.—Trading is routine in the nonferrous metal markets but continued large shipments on old orders is offsetting the lack of new buying to such extent that prices are exhibiting exceptional stability. Price fluctuations, consequently, have been narrow the past week.

At the opening of the present week a firmer tone appeared in copper and zinc. Lead continued to hold steady, however, as did antimony, aluminum and nickel. Tin is a trifle firmer.

Copper—Some metal has been available under 14.25c, Connecticut, the past week. The amount was small, however, and practically all producers have held firmly to 14.25c. Sales were made at this level. Some export business has been done at 14.50c c.i.f. Brass and copper rolling mill products are unchanged.

Zinc—Prices have tended upward although buying has not been large. The stability in the ore market and a steady advance in the market abroad primarily are the strengthening factors. Some prime western metal has sold as high as 5.82½c, East St. Louis, and today sellers were asking up to 5.85c.

Lead—Little change has developed in the market. Prices have held steady at 6.00c, East St. Louis, and 6.10c, New York. Trading is confined to small lots but as little metal has been bought for delivery beyond May buying of size is expected to develop soon.

Tin—Some business was done in tin the past week but the total tonnage purchased was not large. The market today is more than ½-cent under the price ruling at this time a week ago. This decline is accounted for by the fact that early last week prices went up rapidly with fair sized buying and then fell as demand was satisfied.

Antimony—Little activity has been noted in this metal lately but prices have held fairly steady.

Aluminum—The light metal is steady with prices unchanged.—*Daily Metal Trade.*

Discuss Foundry Safety

E. W. Snare, safety first division, Ohio industrial commission, Columbus, O., talked on safety in the foundry at the meeting of the Ohio State Foundrymen's association in Cleveland, April 18. Walter L. Seelbach, Forest City-Walworth Run Foundries Co., Cleveland, discussed the new Gray Iron institute. A discussion of the safety code as applied to foundries was led by Ralph West, West Steel Casting Co., Cleveland.

North Birmingham, Ala., plant of the American Radiator Co., is working full, six days a week, and shipping six cars of radiation daily.

Mill Products

Base prices cents per pound f.o.b. mill

SHEETS	
Yellow brass (high)	18.75
Copper, hot rolled	23.00
Lead, full sheets (cut ¼c more)	9.75
Zinc (100-pound base)	9.00
Aluminum, flat sheets, up to 10 gage, 3" to 72" wide	31.30
SEAMLESS TUBES	
Yellow brass (high)	23.62½
Copper	24.50
RODS	
Yellow brass (high, full turning)	16.50
Naval brass	19.25
WIRE	
Copper, car lots	15.75
Yellow brass (high)	19.25

Old Metals

Dealers' buying prices, cents per pound

HEAVY RED BRASS	
New York	9.25
Chicago	9.25 to 9.50
Cleveland	9.50 to 10.00
HEAVY YELLOW BRASS	
Chicago	6.75 to 7.00
Cleveland	7.25 to 7.50
ZINC	
New York	3.50
Cleveland	3.00 to 3.25
HEAVY COPPER AND WIRE	
New York	11.50 to 11.75
Boston	11.00 to 11.75
Chicago	10.75 to 11.00
Cleveland	11.50 to 11.75
RED BRASS BORINGS	
New York	8.25 to 8.50
YELLOW BRASS TUBING	
Cleveland	7.50
LIGHT COPPER	
New York	10.00 to 10.25
Chicago	9.50 to 9.75
Cleveland	10.00 to 10.25
LIGHT BRASS	
Boston	5.75 to 6.00
Chicago	6.25 to 6.50
Cleveland	5.50 to 5.75
ALUMINUM	
Clippings, Cleveland	17.50
Borings, Cleveland	9.50
Cast, Cleveland	13.00
Cast, Boston	11.50 to 12.00

Secondary Metals

Remelt Aluminum No. 12	16.50 to 17.00
Brass ingot, 85-5-5-5	12.25 to 12.50

Coke By-Products

Sulphate, Toluol, Benzols and Naphthalene Are in Demand

New York, April 24.—Sulphate of ammonia continues in brisk demand, with prices strong at $2.35, delivered. Sellers expect this to continue until early in May, when the fertilizer manufacturers' season will probably come to a close. Export buying is featured by a little business for China at $2.25, port, in double bags.

Toluol also is moving well, with spot material available. Spot prices are continued at 35 cents, works, for material in tanks and 40 cents in drums. Pure and 90 per cent benzols are in good demand. Solvent naphtha and commercial xylol are dull. Naphthalene is active.

Coke Oven By-Products

Per Gallon at Producers' Plants in Tank Lots

	Spot	Contracts
Pure benzol	$0.22	.....
90 per cent benzol	0.22	.....
Toluol	0.35	.....
Solvent naphtha	0.30	.....
Commercial xylol	0.30	.....
Phenol	0.17 to 0.18	.....

Per Pound at Producers' Plants

Naphthalene flakes	0.05½ to 0.06½
Naphthalene balls	0.06½ to 0.07½

Per 100 Pounds Delivered

Sulphate of ammonia	$2.35

Steelmaking at Buffalo is 85 Per Cent

Buffalo, April 24.—Steel output at 85 per cent, as indicated by open-hearth operating schedules is slightly lower than earlier in the month, when 33 of 36 open-hearts units in the district were in operation. The curtailment, which does not exceed three units, is said to be due more to necessary repairs than to actual falling off of demand.

Warehouse

April Sales Generally Averaging Ahead of March Except in Chicago—Building Materials Moving at Better Rate

SALES from iron and steel warehouses generally are heavier than in the same period of March, except at Chicago, where demand lags. Building materials are beginning to move at a better rate as weather becomes more conducive to outdoor operations. Prices remain steady.

Warehouse demand in the New York metropolitan district does not appear as active as a week ago, although buying continues at a better rate than in March, which was the briskest up to that time this year. Structural shapes and bars appear the most active. Prices generally are unchanged, with weakness in black and galvanized sheets.

Sales by the Philadelphia warehouses during the past week continued on an even plane with those of the week preceding. Prices are steady at the levels recently established when quantity differentials were inaugurated.

Warehouse sales continue to gain at Buffalo. Sales of sheets and structural steel have been especially brisk this month. April business promises to be the best of the year to date and compares favorably with that of last April. Prices are unchanged except that the new extras on wide sheets are in force.

Cleveland warehouse sales are maintained at a good rate but little improvement has been reported the past few days. Buying of bars, shapes and plates has improved. Jobbers of sheets report business is not up to seasonal average. General industrial demand is good.

Somewhat heavier sales of steel from warehouse stocks are reported in the Chicago district, and warehouses have been releasing more orders to the mills. It is indicated that April sales, however, may not reach the March volume. Sheet sales have eased off in the past few weeks.

Cincinnati warehouse managers report a slowing down of demand due to bad weather. Prices are unchanged. Little new business is stirring but heavier demand is expected soon.

St. Louis distributors report steady expansion in demand for building materials. Construction operations are gaining, and building permits and contracts let indicate a continuance of present conditions. Since April 1, there has been a steady increase in demand for highway construction supplies, notably reinforcing concrete bars, corrugated pipe and steel for small bridges and culverts. The movement of wire fencing, woven wire and other materials used largely in the agricultural sections is large.

Warehouse Quotations in Cents Per Pound at Leading Market Centers

STEEL BARS

Baltimore	2.50c to 3.31c
Boston	3.265c
Buffalo	3.30c
Chicago	3.00c
Cincinnati	3.30c
Cleveland	3.00c
Detroit	3.00c
Ft. Worth	3.75c
Houston	3.00c
Los Angeles	3.30c
New York† ††	3.20c to 3.25c
Philadelphia*	2.50c
Pittsburgh	2.90c
Portland	3.00c
San Francisco	3.15c
Seattle	3.00c
St. Louis	3.15c
St. Paul	3.25c
Tulsa	3.75c to 4.06c

IRON BARS

Baltimore	2.50c to 3.31c
Boston	3.265c
Buffalo	3.30c
Chicago	3.00c
Cincinnati	3.30c
Detroit	3.00c
Ft. Worth	3.75c
New York†	2.80c to 3.24c
Philadelphia*	2.50c
St. Louis	3.15c
Tulsa	3.75c to 4.06c

REINFORCING BARS

Baltimore	2.80c to 3.31c
Boston	3.265c to 3.50c
Buffalo	2.75c
Cincinnati	3.15c
Cleveland	2.20c
Detroit	3.00c
Ft. Worth	3.50c
Houston	3.00c
Los Angeles cl	3.05c
Los Angeles lcl	3.30c
New York	2.95c to 3.10c
Philadelphia	2.30c to 2.80c
Pittsburgh	2.90c to 3.175c
San Francisco cl	2.85c
San Francisco lcl	3.10c
Seattle	3.00c
St. Louis	3.15c
Tulsa	3.75c to 4.00c
Youngstown	2.30c to 2.60c

STRUCTURAL SHAPES

Baltimore	2.50c to 3.41c
Boston	3.365c
Buffalo	3.40c
Chicago	3.10c
Cincinnati	3.40c
Cleveland	3.00c
Detroit	3.10c
Ft. Worth	4.25c
Houston	3.25c
Los Angeles	3.30c
New York†	3.25c to 3.30c
Philadelphia	2.40c to 2.80c
Pittsburgh	3.00c
Portland	3.00c
San Francisco	3.15c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.35c
Tulsa	3.75c to 4.16c

PLATES

Baltimore	2.50c to 3.41c
Boston	3.365c
Buffalo	3.40c
Chicago	3.10c
Cincinnati	3.40c
Cleveland, ¼-in. and thicker	3.00c
Cleve., 3/16-in.	3.20c
Detroit	3.10c
Detroit, 3/16-in.	3.30c
Ft. Worth	4.00c
Houston	3.00c
Los Angeles	3.30c
New York†	3.25c to 3.30c
New York† (floor)	5.05c to 5.10c
Philadelphia	2.40c to 2.80c
Phila., 3/16-in.	2.60c to 3.00c
Pittsburgh	3.00c
Portland	3.00c
San Francisco	3.15c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.35c
Tulsa	3.75c to 4.16c

No. 10 BLUE ANNEALED

Baltimore	3.00c to 3.66c
Boston, 3/16-in.	3.915c
Buffalo	3.70c
Chicago, to 40 in.	3.50c
Chicago, over 40 in.	3.60c
Cincinnati	3.60c
Cleveland	3.25c
Detroit	3.50c
Ft. Worth	4.70c
Houston	3.90c
Los Angeles	4.00c
New York	3.90c
Portland	4.00c
Philadelphia	3.15c
Pittsburgh**	3.10c
San Francisco	3.75c
Seattle	4.00c
St. Louis	3.60c
St. Paul	3.75c
Tulsa	4.20c to 4.56c

No. 24 BLACK SHEETS

Baltimore	3.60 to 4.00c
Boston	5.00c
Buffalo	4.20c
Chicago	3.95c
Cincinnati	4.05c
Cleveland	3.75c
Detroit	4.10c
Ft. Worth	4.70c
Los Angeles	5.10c
New York	3.90c to 4.10c
Philadelphia*†	3.75c
Pittsburgh‡	3.75c
Portland	4.90c
San Francisco	4.90c
Seattle	5.00c
St. Louis	4.45c
St. Paul	3.95c
Tulsa	4.75c

No. 24 GALVANIZED SHEETS

Baltimore	4.30c to 4.75c
Boston	5.85c
Buffalo	5.05c
Chicago	4.80c
Cincinnati	4.90c
Cleveland	4.60c
Detroit	4.90c
Ft. Worth	5.75c
Houston	5.30c
Los Angeles	5.50c
New York	4.60c to 4.70c
Philadelphia*†	4.75c
Pittsburgh‡	4.60c
Portland	5.65c
San Francisco	5.50c
Seattle	5.75c
St. Louis	5.25c
St. Paul	4.90c
Tulsa	5.55c

BANDS

Baltimore	3.25c to 4.06c
Boston	4.015c to 5.00c
Buffalo	4.05c
Chicago	3.65c
Cincinnati	3.95c
Cleveland	3.65c
Detroit	3.65c
Ft. Worth	4.40c
Houston	3.65c
Los Angeles	4.25c
New York†	4.00c
Philadelphia	3.35c
Pittsburgh	3.60c
Portland	4.00c
San Francisco	4.00c
Seattle	4.00c
St. Paul	3.90c
Tulsa	4.71c

HOOPS

Baltimore	4.16c
Boston	5.50c to 6.00c
Buffalo	4.05c
Chicago	4.15c
Cincinnati	4.40c
Cleveland	3.65c
Detroit	4.15c
New York†	4.50c
Philadelphia	3.60c
Pittsburgh	4.50c
Seattle	5.00c
St. Paul	4.40c

COLD FINISHED STEEL

	Rounds, hexagons,	Flats, squares
Baltimore	3.25c	3.75c
Boston	3.45c	3.95c
Buffalo	3.95c	4.45c
Chicago	3.60c	4.10c
Cincinnati	3.85c	4.35c
Cleveland	3.65c	4.15c
Detroit	3.85c	4.35c
Los Angeles (a)	4.50c	.....
New York	3.40c	3.90c
Philadelphia	3.35c	3.85c
Pittsburgh	3.60c	4.10c
Portland (a)	5.00c	.....
San Fran. (a)	4.25c	.....
Seattle (a)	5.00c	.....
St. Paul (a)	3.85c	.....
Tulsa	4.66c	5.16c

(a) Rounds only.

COLD ROLLED STRIP

Boston, 0.100-inch, 500 pound lots	5.30c
Buffalo	5.85c
Chicago (b)	6.10c
Cincinnati	7.15c
Cleveland (b)	5.95c
Detroit	5.80c
New York	5.15c
Philadelphia (c)	5.00c

(b) Net base, straightening, cutting, boxing 1 ton or more.
(c) Plus mill, size and quantity extras.

SWEDISH IRON AND STEEL

New York duty paid

Hollow drill steel	14.00c
Iron bars, rounds	6.25c
Flats and Squares	
Baltimore, New York, Phila.	6.60c

*Plus quantity differentials. †Minus quantity differentials. ††Domestic bars. ‡10 to 24 bundles. **25 or more sheets. *†50 or more bundles.

Coast Asks Much Pipe

Bids on Aqueducts Involve Plates or Cast Pipe—
General Demand Good

SAN FRANCISCO, April 21.—(*By Air Mail*)—Demand for iron and steel products is holding up well, with structural shapes and cast iron pipe most active. Bids were opened this week on the Sequoia and Wildcat aqueducts in Oakland involving over 8500 tons of plates or 30,000 tons of cast iron pipe. The price structure on mill material is fairly well maintained but on structural shapes fabricated and erected and reinforcing bars in place, low levels continue.

Pig Iron and Coke

Improvement in demand for castings this year has been slight and melters are buying limited tonnages. During the week another shipment of 850 tons of India iron arrived. Most of this material was taken by bay district foundries but several hundred tons were reshipped to Portland and Seattle. The next shipment of this iron will arrive late this month, some 1400 tons being enroute. A shipment of 4500 tons of English coke is scheduled to arrive about May 5. Prices are unchanged.

Coast Pig Iron Prices

Utah basic	$25.00 to 26.00
Utah foundry	25.00 to 26.00
*German	24.25
*Indian	24.00 to 25.00
*Dutch	24.50

*C.i.f. duty paid.

Bars, Plates and Shapes

Concrete bar awards totaled 1889 tons this week, bringing the aggregate to 36,812 tons for the year, compared with 16,731 tons for the corresponding period last year. Important awards included 1220 tons for drainage improvement district No. 23 at Los Angeles, placed with unnamed interests. Most of the business at present is in small projects calling for 20 to 50 tons.

Plate fabricators are keenly interested in the outcome of the 8500-ton Wildcat and Sequoia aqueducts in Oakland, bids on which were opened April 20. This is the largest project that has come up for figures in over a year. Awards this week totaled 397 tons. So far this year 11,419 tons has been booked, compared with 26,081 tons for the same period last year. The Los Angeles Mfg. Co. has booked 307 tons of welded steel pipe for Ontario, Calif. Bids will be opened May 9 for 650 tons for two scows and a dredger for the state harbor commission at San Francisco. Bids are being taken on 700 tons for a carfloat for the Santa Fe at San Francisco. Prices continue 2.35c c.i.f.

Awards of structural shapes this week aggregated 3027 tons and brought the total for the year to 54,840 tons, compared with 66,587 tons for the corresponding period in 1927. Among the larger lots were 606 tons for the Freeport, Calif., bridge placed with the Moore Drydock Co., 570 tons for a church in Los Angeles, booked by the Union Iron Works and 400 tons for a government hangar at San Diego by McClintic-Marshall Co. Pending business exceeds 15,000 tons. Plain material is 2.35c c.i.f.

Other Finished Material

While only one cast iron pipe letting of over 100 tons was reported this week, considerable new work is pending. Robert McNair took 275 tons for Livingston, Calif. Bids were opened this week on the largest inquiry ever up on the coast. This tonnage exceeds 30,000 tons for the Wildcat and Sequoia aqueducts in Oakland. The United States Cast Iron Pipe & Foundry Co. was low on 8744 tons for Long Beach, Calif. Bids were also opened on 2264 tons for Monrovia, Calif. New inquiries include 1799 tons for the Venice outfall sewer, Los Angeles. Pending business exceeds 44,500 tons. Alternate bids on 710 tons of lapweld pipe were received at Monrovia, Calif., this week.

Seattle Buys Bars

Largest Tonnage of Year, 2000 Tons, Placed—Markets Active

Seattle, April 19.—Award of 2000 tons of reinforcing material for the six-story department store under construction for the Bon Marche, Seattle, featured the local steel market this week. The contract was divided between the Northwest Steel Rolling Mills and the Pacific Coast Steel Co.

While mill representatives report business quiet, prices are holding firm. Several large structural jobs are to be awarded within 60 days, including the Queets river bridge, 500 tons, the Kettle Falls bridge, 1125 tons, and a bridge at Seattle, tonnage unstated.

Montana has awarded highway contracts totaling $468,000, including nine small bridges. Oregon will open bids this week for six road projects including three bridges involving 310 tons structurals and 33 tons reinforcing. Washington has bid calls out for opening April 24, May 8 and May 15.

Bars, Plates and Shapes

The Pacific Coast Steel Co. has taken 100 tons of reinforcing bars for an apartment house at Seneca and Summit, Seattle. More than 1000 tons is pending.

Mill prices of bars and shapes are unchanged at 2.35c and plates are firm at 2.30c. Less competition from foreign materials is evident. The low bidder for 435 tons of plates involved in the Kittitas canal project siphons was the Pittsburgh-Des Moines Steel Co. Seattle is preparing plans for a second bridge across the Duwamish river, of steel and concrete, bascule type, 288 feet, with 102-foot steel spans on either side and concrete approaches.

Leith, Murray & Co., British Columbia agents for a Bavarian firm, were awarded the contract for supplying Victoria with approximately 225 tons of cast iron pipe. Camas, Wash., is asking bids for a $17,500 water improvement. Vancouver, B. C., will receive bids May 15 for furnishing 2000 feet of 18-inch steel pipe. H. C. Purcell, Seattle, at $2,345 submitted the low bid for furnishing fittings for a pipe line at Tacoma.

Amalgamated Is Framing Wage Demands

Pittsburgh, April 24.—Changes to be sought by the Amalgamated Association of Iron, Steel and Tin Workers for the scale year beginning July 1 are being formulated and will be laid before employers at a conference at Atlantic City, N. J., the date of which is yet to be determined. The rumor that puddlers would demand a flat wage scale instead of the sliding scale system proves unfounded.

For puddlers the differential in the boiling scale would be changed to read 25 cents per card point from base up. The present progression rate of 22½ cents starts with base and runs to a 1.40c card or $8.80 per ton, and after that is at a 25-cent rate.

Puddlers also ask $1.50 a ton extra in July, August and September and $2.00 per ton for roasting iron. An advance of 15 per cent is sought for busheling on both cinder and sand bottom. Muck mill crews want a 10 per cent advance. A 10 per cent advance for bar mill crews is asked, along with a minimum $5 daily rate for bar mill roughers and catchers. On guide hoops and cotton tie mills a 10 per cent advance also was asked.

The most radical change is suggested in the tin mill scale. It is proposed to base wages on the market price of tin plate rather than upon the ascertained sheet price average.

Hanna Rebuilds Stack

Buffalo, April 24.—Hanna Furnace Co. has started complete rebuilding of one of its Buffalo stacks. The furnace will be modernized and its capacity considerably increased.

Steel Corp. Report

Shows Substantial Increase Over Fourth Quarter of 1927

New York, April 24.—Net earnings of the United States Steel Corp. for the quarter ended March 31 totaled $40,934,032, compared with $31,247,529 in the fourth quarter of 1927 and $45,584,725 in the corresponding period of last year. Net income for the first quarter, after deducting depreciation, depletion and interest, amounted to $21,331,871, against $13,794,833 in the preceding quarter and $26,327,362 a year ago.

Net income is equal after preferred dividends to $2.11 a share on the 7,116,235 common shares, against $1.05 a share the preceding quarter and $3.94 a share last year.

Directors declared the regular quarterly dividends of $1.75 a share on the preferred and common stock.

A monthly comparison of net earnings follows:

	1928	1927	1926
January	$11,899,549	$13,512,787	$13,810,149
February	13,581,337	14,943,305	14,385,381
March	15,453,146	17,128,633	16,865,755
First quarter	$40,934,032	$45,584,725	$45,061,285

The consolidated income account for the quarter compares as follows:

	1st quarter 1928	4th quarter 1927	1st quarter 1927
Net earnings	$40,934,032	$31,247,529	$45,584,725
Dep. reserve	12,202,966	10,623,859	11,858,544
Sinkg. fund	2,823,927	2,940,068	2,801,843
Interest	4,097,848	4,115,658	4,238,894
Premium bonds redeemed	477,420	323,969	358,082
Adj. credit	.....	550,858	.....
Net income	$21,331,871	$13,794,833	$26,327,362
Pfd. divs.	6,304,920	6,304,920	6,304,919
Com. divs.	12,453,411	12,453,412	12,453,411
Surplus	$ 2,573,541	*$4,963,499	$ 7,569,032

*Deficit

Employment Up in March

Washington, April 24.—Employment in manufacturing industries in March was 0.7 per cent greater than in February while payrolls were 1.3 per cent larger, states the department of labor. Employment in March thus was the highest since October, 1927. The iron and steel and allied industries, excepting foundries and machine shops, were employing more persons in March than in March, 1927.

Birdsboro Stack To Be Rebuilt Shortly

After uninterrupted operation since Jan. 15, 1924, the blast furnace of the E. & G. Brooke Iron Co., Birdsboro, Pa., goes out of blast May 1 for relining and rebuilding of the shell. Height of the stack will be increased from 75 to 82 feet, the bosh will be increased to 17 feet 7 inches and the hearth to 13 feet 9 inches. Diameter at the stock line will be 12 feet 3 inches. The Freyn Engineering Co., Chicago, is the engineer while material for the shell has been fabricated by Wm. B. Pollock & Co., Youngstown, O. Sufficient iron has been piled to carry the company over the three and one-half months the furnace will be out.

Show Reveals Importance of Metals in Airplane Industry

THAT producers of ferrous and nonferrous metals should watch the infant air transportation industry as a coming important consumer of their products was made plainly apparent at the All-American Aircraft show, held at the Detroit convention hall April 14 to 21, under the sponsorship of the Detroit board of commerce. Many of the exhibits of the 135 companies represented revealed not only a dependence on steel for hangars, light standards and towers, airport fences, etc., but also a definite trend toward metal construction of the planes themselves.

Of major interest in the show were 87 airplanes exhibited by nearly 50 manufacturers. These craft ranged in size from tiny air flivvers selling for about $2000 to large 3-motor passenger or freight planes priced at about $45,000. Most of the smaller machines were of spruce and fabric construction, but among the larger models, the use of welded seamless steel tubing for the fuselage, steel or aluminum for spars and ribs, and duralumin for fuselage and wing covering was noticeable.

All-metal planes were exhibited by the Stout Metal Airplane Co., division of the Ford Motor Co., Detroit; Hamilton Metalplane Co., Milwaukee; Halpin Development Co., Cincinnati; and Lenert Aircraft Co., Pentwater, Mich. The structures of the Fokker planes, built by the Atlantic Aircraft Corp., Hasbrouck Heights, N. J., are of steel tubing except for the wings.

The majority of the planes were equipped with landing wheels, although a number of amphibian craft and several seaplanes were in evidence. The trend in the float type of landing gear is toward all-metal construction. With few exceptions the pontoons displayed were made of aluminum alloy sheets.

Exhibits of propellers revealed an interesting tendency to depart from the first used blades of laminated wood. Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., displayed detachable blades of a non-metallic compound, while the Standard Steel Propeller Co., Pittsburgh, exhibited two and three-blade, adjustable pitch, all-metal propellers. Hamilton Aero Mfg. Co., Milwaukee, also displayed metal propellers and pontoons. MacWhyte Co., Kenosha, Mis., showed streamline tie rods for wing bracings.

Ten builders of airplane engines were represented. Radial engines were displayed by Wright Aeronautical Corp., Patterson, N. J.; Pratt & Whitney Aircraft Co., Hartford, Conn.; Fairchild-Caminez Engine Corp., New York; National Aero Corp., New York; Ryan Aeronautical Corp., San Diego, Cal.; R. K. LeBlond Machine Tool Co., Cincinnati; and Warner Aircraft Corp., Detroit. Curtiss Aeroplane & Motor Co., Garden City, N. Y.; Packard Motor Car Co., Detroit; and Dayton Airplane Engine Co., Dayton, O., exhibited block-type airplane engines.

Reliance of motor builders on good bearings was emphasized by the representation at the show of Norma-Hoffman Bearings Corp., Stamford, Conn.; S. K. F. Industries, New York and Bohn Aluminum & Brass Corp., Detroit. Bausch Machine Tool Co., Springfield, Mass. demonstrated uses of duralumin.

Basic Pig Iron Is Reduced

(*Concluded from Page* 1087)

record. Sales totaled 7000 tons, of which the St. Louis Gas & Coke Co. booked 5000 tons. The Sloss-Sheffield Steel & Iron Co. took about 1500 tons, the rest going to Chicago furnaces. The chief local producer is selling for third quarter on a basis of $19 to $19.50, furnace.

Birmingham, Ala., April 24.—Deliveries on pig iron contracts are steady, and more foundry iron is moving than is being made. The policy of buying only for immediate needs is maintained, even by melters who have many orders for their products. The price is firm at $16, base, Birmingham. Two blast furnaces in this district are being repaired.

Philadelphia, April 24.—There are indications considerable pipe iron may be bought soon; otherwise the pig iron market here is quiet. Prices are unchanged. The largest single orders involve several hundred tons.

Auto Output Continues on Upgrade

Washington, April 24.—Automobile production in the United States continued gaining in March, totaling 412,825 passenger cars and trucks, according to the department of commerce statistics. Following are further monthly comparisons:

	*United States		Canada†	
1926	Total	Passenger cars	Trucks	Total
Total	4,298,802	3,808,753	490,049	204,550
1927				
March	394,443	345,911	48,532	23,250
Total, 3 mos.	938,133	809,732	128,491	51,281
April	404,759	357,009	47,750	24,611
May	404,115	357,150	46,965	25,708
June	321,969	278,729	43,238	19,208
July	268,485	236,868	31,617	10,987
Aug.	308,826	274,381	34,445	12,526
Sept.	260,387	226,443	33,944	11,262
Oct.	219,719	183,042	36,677	7,791
Nov.	134,416	109,758	24,658	6,617
Dec.	133,579	106,080	27,499	3,435
Total	3,394,386	2,939,192	455,194	179,426
1928				
Jan.	231,693	205,543	26,150	8,463
Feb.	323,514	290,831	32,683	12,504
March	412,825	371,408	41,417	9,274
Total 3 mos.	968,032	867,782	100,250	30,241

†Reported by Dominion bureau of statistics.
**Not available.
*Figures revised and corrected to date.

Plate Bookings Down

Washington, April 24.—Bookings of fabricated steel plate in March declined slightly from February, statistics furnished by the department of commerce show. Following are monthly comparisons:

	*Total	Oil storage tanks	Gas holders	Blast furnaces	Stacks and miscellaneous
1926 (year)	513,913	175,367	47,524	14,406	196,849
1927					
March.....	55,407	24,127	5,135	857	17,900
Total, 3 mos...	150,904	71,452	10,463	2,031	44,476
April	47,347	18,019	9,450	420	15,069
May	37,883	10,855	2,524	364	20,865
June	28,811	7,402	2,263	1,026	15,192
July	35,326	17,199	1,034	537	14,274
Aug.	48,577	29,691	3,504	481	11,385
Sept.	38,662	15,421	2,254	873	14,576
Oct.	47,090	18,648	3,252	385	11,599
Nov.	27,341	8,920	978	422	10,794
Dec.	35,648	13,367	3,490	385	13,088
Total (year)..	497,697	210,974	39,212	6,924	171,318
1928					
Jan.	35,787	8,758	2,062	1,225	16,412
Feb.	*49,820	25,532	3,679	143	*15,420
March	45,071	24,596	1,897	699	13,544
Total, 3 mos.	130,678	61,229	7,638	2,067	45,376

*Revised

Hoist Sales Gain

An increase in the number and value of hoists sold in March was indicated by a statement just issued by the Electric Hoist manufacturers' association, 165 Broadway, New York. Member companies, it said, had an increase of 39.598 per cent over February in the number of orders placed and an increase of 50.8778 per cent in the value of the orders. Shipments were 28.253 per cent larger in March than in the preceding month.

March Barrel Output on Increase

Washington, April 24.—Production of steel barrels in March gained over the February total, according to the department of commerce. Members of the Steel Barrel Manufacturers' association, Cleveland, report 356,619 barrels shipped in March, with unfilled orders of 483,481. March volume of business totaled $1,034,309. I. C. C. barrels were produced at 24 per cent of capacity, light barrels at 63 per cent, and all barrels at 55 per cent of capacity. Monthly comparisons follow:

			Unfilled orders for delivery	
1927	Production	Shipments	within 30 days	beyond 30 days
Mar.	575,850	568,821	285,802	1,260,278
Apr.	599,771	609,090	296,395	1,069,160
May	588,077	575,712	250,029	947,865
June	594,782	605,123	232,468	966,371
July	578,223	576,602	308,789	1,037,899
Aug.	615,152	610,454	244,518	862,086
Sept.	521,899	525,374	235,181	889,256
Oct.	578,408	572,893	211,665	788,894
Nov.	500,909	497,345	182,065	633,724
Dec.	444,227	454,638	221,897	1,086,468
1928				
Jan.	475,906	474,159	241,145	1,110,652
Feb.	518,944	514,362	297,889	1,119,738
Mar.	636,855	644,521	304,043	1,039,540

Structural Orders Off

Washington, April 24.—Computed tonnage of fabricated structural steel orders in March dropped 8000 tons from the February total, according to the department of commerce and noted briefly in IRON TRADE REVIEW last week. Following are monthly comparisons:

	Actual tonnage	Per cent of capacity	Computed tonnage	Shipments computed
Total 1926		67	2,890,800	3,218,400
1927				
Mar.	189,982	62	232,500	221,250
Total 3 mos.		60	671,250	618,750
April	215,325	70	262,500	232,500
May	190,103	62	232,500	232,500
June	187,147	61	228,750	258,750
July	280,613	92	345,000	258,750
Aug.	223,620	73	273,750	285,000
Sept.	218,022	71	262,250	270,000
Oct.	236,719	77	288,750	251,250
Nov.	193,843	63	236,250	247,500
Dec.	215,439	70	262,500	240,000
Total		68	3,063,500	2,895,000
1928				
*Jan.	171,356	56	210,000	210,000
**Feb.	212,068	71	266,250	236,250
†Mar.	202,251	69	258,750	236,250
‡Total 3 mos.		65	735,000	682,500

*Reported by 221 firms with a capacity of 303,750 tons.
**Reported by 210 firms with a capacity of 299,420 tons.
†Reported by 193 firms with a capacity of 292,160 tons.
‡All figures revised.

March Castings Orders Show Drop

Washington, April 24.—Bookings of commercial steel castings in March dropped from the February total, statistics of the department of commerce show. Further monthly comparisons follow:

	BOOKINGS		PRODUCTION	
Total	*Total net tons	Railway specialties	*Total net tons	Railway specialties
1926	1,035,778	404,945	1,135,955	427,016
1927				
March	90,041	34,680	102,836	41,232
Total, 3 mos.	292,503	129,496	278,837	110,591
April	81,044	32,279	94,677	39,189
May	72,744	28,946	86,942	35,236
June	90,898	39,455	87,767	34,596
July	74,246	31,011	79,726	32,576
Aug.	63,528	21,144	87,004	32,397
Sept.	52,351	18,396	70,024	25,618
Oct.	51,748	16,625	62,409	21,947
Nov.	62,683	27,639	58,997	19,146
Dec.	76,953	39,112	58,220	19,358
Total	918,698	384,103	964,603	370,654
1928				
Jan.	91,069	41,276	74,079	28,714
Feb.	90,244	41,096	82,806	37,719
March	81,834	30,956	92,193	38,417
Total 3 mos.	263,147	113,328	253,078	104,850

*For tonnage of miscellaneous castings deduct Railway Specialties from this total.

Foundry Equipment Up

Cleveland, April 24.—Foundry equipment orders for March gained over February, according to the Foundry Equipment Manufacturers' association. Following are monthly comparisons, the base of the index being the average of monthly shipments for 1922-24:

	1925	1926	1927	1928
Jan.	104.2	168.2	180.4	*132.7
Feb.	108.8	154.9	198.0	123.6
Mar.	159.3	157.3	131.1	138.6
Apr.	124.3	113.2	130.0	.....
May	113.3	128.5	134.8	.....
June	110.5	133.5	138.4	.....
July	117.0	127.3	89.9	.....
Aug.	190.0	141.2	106.4	.....
Sept.	94.2	114.0	80.4	.....
Oct.	149.5	140.5	98.0	.....
Nov.	180.3	133.4	95.8	.....
Dec.	140.1	181.0	106.8	.....

Base: Average monthly shipments for 1922-23-24.
*Revised.

Receivers Are Appointed

The McMyler-Interstate Co., Bedford, O., was thrown into receivership April 23 on petition of the largest holder of common stock, the action being reported friendly. The receivers are A. G. Newcomb, former common pleas judge at Cleveland, and P. A. Connolly, of V. C. Taylor & Sons Co., real estate dealer of Cleveland. Current orders are said to exceed $600,000 and assets are claimed to exceed liabilitites but ready money to meet debts totaling $2,000,000 is lacking.

Three-fifths of the tin plate entering the world's markets at present is of British origin.

Industrial Men in the Day's News

Elmer T. McCleary, New President of Republic Iron & Steel Co.

ADVANCEMENT through the subordinate positions of an important middle western steel company prepared him for his new office, the most responsible of his career.

STARTING in industry as a chemist, he displayed energy and capability for handling executive duties, and his rise was steady and continuous.

WITH a pleasing personality and a sense of fairness, he has been endeared to the rank and file of the organization he served for 21 years.

STEADY advancement through the ranks of one of the important middle western independent steel companies has prepared Elmer T. McCleary for the most responsible position he has yet had to fill, that of president of the Republic Iron & Steel Co., Youngstown, O. Following the resignation, April 13, of Thomas J. Bray, who served as executive head of the Republic company for 17 years, Mr. McCleary, who has been vice president in direct charge of the operating department of the Youngstown Sheet & Tube Co., also of Youngstown, was selected by the board of directors of Republic to fill the vacancy. This was noted briefly in IRON TRADE REVIEW last week.

Mr. McCleary was born at Pine Grove Furnace, Cumberland county, Pa., and is still several years under 50. He is a graduate of Penn State college, State College, Pa., specializing there in chemistry and metallurgy. He received his degree from that institution with the class of 1901.

The first connection Mr. McCleary made in industry was with the Diamond State Steel Co., Wilmington, Del., long since passed out of existence. Following his association with this company he traveled westward to the chemistry department of the Ohio works of the Carnegie Steel Co. at Youngstown. A few years later, in 1907, Mr. McCleary became chief chemist for the Sheet & Tube company, his first connection with that company. His advancement with the Sheet & Tube company was steady and continuous thereafter for the 21 years he spent with that organization.

He was appointed assistant superintendent of the steel works, and later was made superintendent. Finally he was named assistant general superintendent, holding this position until the absorption by the Youngstown Sheet & Tube Co. of the Brier Hill Steel Co. in March, 1923, and the Steel & Tube Co. of America in June, 1923. At the time of this expansion Mr. McCleary was named district manager of the Youngstown district. Later he was advanced to the position of vice president in direct charge of the operating department, where he remained until he resigned to take over the duties of the executive head of the Republic company.

With a pleasing personality and a sense of fairness, Mr. McCleary has been popular throughout the rank and file of the Sheet & Tube organization. Energetic, thorough and capable, the executives of that company showed their confidence in him by his steady promotions through the various subordinate positions. More trust in his ability has been evidenced by his recent selection as head of one of the larger independent producers.

Men of Industry

Personal News of a Business Character Pertaining to the Iron and Steel and Related Fields of Enterprise

JOHN S. OURSLER, general superintendent of the Homestead works of the Carnegie Steel Co., Pittsburgh, has been elected vice president, succeeding I. Lamont Hughes. Mr. Oursler first entered the steel industry in 1882 at Sharpsville mills as a boy of 14. He was made superintendent of blast furnaces at the New Castle, Pa., plant of the Carnegie company in 1896, and later served in the same capacity at the Mingo Junction and Youngstown, O., works. Mr. Oursler was named general superintendent in 1919.

Ralph H. Watson, assistant general superintendent, has been named general superintendent, succeeding Mr. Oursler.

* * *

James A. Farrell, president of the United States Steel Corp., sailed April 21 for a six-week tour of Europe.

* * *

Harry E. Kies, executive manager, malleable iron department, American Radiator Co., Buffalo, is now also manager of the Arco steel department, succeeding E. Phelps Langworthy of that plant.

* * *

S. S. French, manager of the Berger division at Canton, O., of the Central Alloy Steel Corp., has been elected a director, succeeding C. E. Stuart, who resigned as president of the Central Alloy company last year.

* * *

Kenneth Grant, formerly with the Machinists Supply Co., has joined the sales organization of Foote Bros. Gear & Machine Co., both of Chicago, to cover territory in Wisconsin, Illinois and Iowa.

* * *

R. W. Thompson has been appointed advertising manager of the Reading Iron Co., Reading, Pa., succeeding A. F. Hartranft. Mr. Thompson previously was with the York Ice Machinery Co., Brooklyn, N. Y.

* * *

W. G. Owen, formerly sales manager of the Haws Refractories Co., Johnstown, Pa., has joined the sales force of the General Refractories Co., Philadelphia. Mr. Owens will assume charge of the Philadelphia territory, relieving Mr. L. Tschirky, who will devote his time to general sales promotion and the sales development of the company's specialty products.

* * *

Harold C. Smith, president of the Illinois Tool Works, Chicago, was elected president of the National Metal Trades association at its thirti-

HAROLD C. SMITH

eth annual convention held in New York, April 25 and 26. Detailed announcement of other new officers is on page 1105.

* * *

Walter C. Buetow, since 1924 chief bridge engineer for Stein Construction Co., Milwaukee, has been appointed state highway engineer succeeding Herbert J. Kuelling who has resigned to become consulting engineer for the Associated Wisconsin Contractors.

* * *

P. C. McBeth has been appointed acting manager of the Pittsburgh office of the Niles Tool Works Co., Hamilton, O., division of Niles-Bement-Pond Co., succeeding William McCormick, whose resignation was announced in IRON TRADE REVIEW, issue of April 12.

* * *

Marcus Chase, sales manager of Niles-Bement-Pond Co., New York, has resigned after service of 29 years with that company. The past 19 years of that time, Mr. Chase had been manager of the Boston office.

M. S. Bradley, an assistant to Mr. Chase for 15 years, will succeed him at Boston.

* * *

H. G. Walton has been made assistant general manager of general sales of the Bethlehem Steel Co., with headquarters at Bethlehem, Pa.

George F. Hocker has been appointed to succeed Mr. Walton as manager of sales of forgings, ingot molds, castings, wheels and axles.

* * *

D. E. McLaughlin, formerly vice president of the Pacific Coast Steel Co., San Francisco, has been elected president, succeeding E. M. Wilson, who died last November.

William Pigott Sr. has been elected chairman of the board and Henry M. Robinson, president of Los Angeles First National Bank, has been elected a director.

* * *

M. G. Sternberg, general foundry superintendent of the Hubbard Steel Foundry Co., East Chicago, Ind., has been appointed general superintendent in charge of the entire plant, taking over the duties of Robert W. Freeland, whose death was announced in IRON TRADE REVIEW, issue of April 12.

H. A. Forsberg who has been production engineer, has been made assistant general superintendent.

* * *

Martin A. O'Mara, formerly vice president in charge of eastern sales for White Motor Co., has been elected president of the Brockway Motor Truck Corp., New York.

George A. Brockway, founder and formerly president, has been made chairman. He will continue in charge of the company's finances and supervise operations at the Cortland plant.

J. W. Stephenson, at one time president of the Indiana Truck Corp., has been made a director and vice president, as well as chairman of the executive committee. He will continue in charge of the Marion, Ind., plant.

* * *

Ernest L. Becker has become associated with the H. W. Roos Co. Inc., Cincinnati. Previous connections of Mr. Becker have included the Andrews

Steel Co., Newport Rolling Mill Co., Globe Iron Roofing & Corrugating Co. and the Newport Culvert Co., where he had charge of advertising and sales promotion.

* * *

Joseph T. Ryerson, of Joseph T. Ryerson & Son Inc., has been elected president of the Industrial Club of Chicago.

* * *

J. R. Poyser continues as sales manager for Doelger & Kirsten, Milwaukee, instead of resigning, as was stated in last weeks' issue.

* * *

F. W. Shipley, who has been made foundry metallurgist for Fairbanks-Morse & Co. at Beloit, Wis., was graduated from Purdue university, school of chemical engineering, Lafayette, Ind., in 1921.

* * *

A. T. Thom, vice president and general manager of the Ontario Wind Engine & Pump Co. Ltd., Toronto, Ont., has been appointed managing director of the Waterloo Mfg. Co. Ltd. Waterloo, Ont.

* * *

Donald M. Wight, recently connected with the foundry department of the General Electric Co., Schenectady, N. Y., has resigned to enter the patent law profession and will specialize in foundry and metallurgical patents.

* * *

H. H. Champ, vice president of the Steel Co. of Canada Ltd., Hamilton, Ont., has been appointed by the Dominion government as representative of the employers of Canada at the eleventh session of the International Labor conference which opens at Geneva, Switzerland, May. 28.

* * *

James H. Anderson has become connected with the Mt. Vernon Car Mfg. Co., Mt. Vernon, Ill. Mr. Anderson was foundry superintendent of the C. S. Bell Co., Hillsboro, Ill., for 12 years, leaving that company to become foundry superintendent of the Stover Mfg. & Engine Co., Freeport, Ill. He then was general manager of the Traction Foundry & Machine Co., until that company went out of business.

* * *

John T. Stoney, vice president of the Ferro Machine & Foundry Co., has resigned and will devote all of his time to the Stoney Foundry Engineering & Equipment Co., both of Cleveland. Eight years ago Mr. Stoney organized the Stoney Foundry company, of which he now is president. Mr. Stoney's son, R. E. Stoney, who also has been connected with the Ferro Machine company for a number of years, is joining his father with the Stoney company.

* * *

H. A. Stamper has been placed in charge of consumer motor sales in New York for Lincoln Electric Co., Cleveland. Mr. Stamper is a graduate of Rensselaer Polytechnic institute, Troy, N. Y.

D. F. Titus, formerly with the Portland Cement association, is now in charge of welder service in the New York district.

A. H. Kirkpatrick has been named manager of welder service in the Cincinnati district, succeeding D. W. Carver, who has been transferred to the Cleveland district.

H. E. Nelson, formerly with Willys-Overland Co., Toledo, has been placed in charge of consumer motor sales at Cincinnati.

P. A. Ludwig, who has been placed in charge of welder service in Philadelphia, formerly was with Welding Engineers Inc.

Forrest Kessler has been transferred from the welding time study department at the Lincoln Electric plant to

(*Concluded on Page* 1108)

REVIEW WORK IN METAL TRADES

National Association Reports Membership of 1100, Gain of 35 Per Cent in Ten Years—H. C. Smith New President

THE thirtieth annual convention of the National Metal Trades association was held in Hotel Astor, New York, April 25-26. Harold C. Smith, president, Illinois Tool Works, was elected president of the association. Other officers elected are: First vice president, J. G. Benedict, Landis Machine Co., Waynesboro, Pa.; second vice president, Jacob D. Cox Jr., Cleveland Twist Drill Co., Cleveland; treasurer, J. O. O'Leary, Arthur J. O'Leary & Son Co., Chicago; councilors for two years, J. H. Van Alstyne, Otis Elevator Co., New York; H. C. Beaver, Rolls-Royce of America, Inc., Springfield, Mass.; J. C. Spence, the Norton Co., Worcester, Mass.; R. J. Russell, Century Electric Co., St. Louis; Theodore Trecker, Kearny & Trecker Corp., Milwaukee; Paul T. Norton, Case Crane & Kilbourne Jacobs Co., Columbus, O.

Magnus W. Alexander, president, national industrial conference board, discussed the unemployment situation from the standpoint of the machinization of industry. Howard Coonley, president, Walworth Co., Boston, analyzed and discussed the subject of industrial budgeting as it applies to metal-working plants.

Bernard J. Mullaney, vice president, Peoples Gas Light & Coke Co., Chicago, discussed the present position and the effect of government interference with public utility progress. Walter Gordon Merritt, League for Industrial Rights, made an address on the tendencies to change laws pertaining to the antitrust act and to unduly restrict the judiciary.

George Seyler, works manager, Lunkenheimer Co., Cincinnati, converted the Thursday morning assembly into an informal demonstration of the modified conference plan in foremanship. This was followed by continuing the conference plan on the subject of wage incentives for foremen. Sterling Morton, president, Morkrum-Kleinschmidt Corp., Chicago, and H. W. DeBruin, Jeffrey Mfg. Co., Columbus, O., conducted the conferences.

Gordon L. Hostetter, manager, Chicago Employers association, spoke on "Rackets and Racketeering." He disclosed the motives affecting a great deal of the bombing and other forms of coercion brought to bear on a number of small business men in the metropolitan center.

The annual banquet Wednesday evening was one of the largest in the association's history. Charles Nagel, St. Louis, secretary of commerce and labor in the administration of President Taft, talked on "The Majesty of Law." Dr. Samuel W. Grafflin, New York, gave an address on "The First Principles in Business."

Committees directing various departments of the association reported marked progress. The work of the educational and industrial committees in the publication of "Foremanship and Methods of Wage Payment" formed outstanding achievements of the year. For 30 years the association has operated successfully in the field of labor. It now has a membership of nearly 1100 member plants, employing approximately 1,000,000 metal workers. The increase in its membership over a ten-year period is reported as 35 per cent.

Preceding the convention branch executives held their spring conference. The presidents' and secretaries' banquet was held Tuesday evening. The annual alumni banquet also was held Tuesday evening, and the annual membership banquet Wednesday.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

JOSLYN MFG. & SUPPLY CO., Chicago, manufacturer of telephone pole hardware, wire and poles, signal and train control devices, has bought the plant of the Fort Wayne Rolling Mill Corp., Fort Wayne, Ind. The latter was placed in the hands of a receiver in January and operated as a going concern. The plant will be changed from iron to steel production and the 8-inch mill is expected to be started about May 1. Small bars, bands and special section will be rolled. The Joslyn company has a rolling mill, hot-dip galvanizing plant and warehouse at Chicago and branches in other cities.

* * *

JO. HENSHAW, seller of pig iron and coke, Boston, has removed his offices from 79 Milk street to the Oliver building, 141 Milk street.

* * *

SUPERIOR DIE CASTING CO., Cleveland, has moved to its new and larger plant at 875 East Seventieth street. Additional production facilities have been made available.

* * *

AMERICAN METAL CO. INC. LTD., American Zinc & Chemical Co., Langeloth Coal Co. and Climax Molybdenum Co., Pittsburgh, have removed their offices to 2010 Clark building.

* * *

MORGAN MFG. CO., Keene, N. H., has changed its name to Morganmade Inc. This is a reorganization of the old company to obtain sounder capitalization and stronger management.

* * *

SUPERIOR ELECTRIC PRODUCTS CO., St. Louis, has been incorporated with $250,000 capital. It has been engaged in manufacturing household appliances for a number of years and recently increased floor space from 20,000 to 40,000 square feet.

* * *

LANDIS MACHINE CO., St. Louis, manufacturer of leather-stitching machinery, has bought a four-story building adjoining its plant from Moon Bros. Mfg. Co. and will occupy about half the added space, 50,000 square feet.

* * *

ORTON CRANE & SHOVEL CO., Chicago, has elected officers, as follows: President and general manager, P. A. Orton Sr.; vice president and manager of sales, P. A. Orton Jr.; vice president and manager of sales in New York territory, Herbert Mertz; treasurer, Harry Shaffer; works manager, Alex Orton. C. C. Case and J. L. Kenower are directors.

* * *

SCOTT STEEL CO., 1111 Westminster building, 110 South Dearborn street, Chicago, has been formed by Charles T. Scott, formerly associated with Briggs & Turivas and the Republic Rolling Mill Corp., Chicago. The company deals in iron, steel, scrap.

* * *

CONSOLIDATED PRODUCTS CO., dealer in used chemical machinery, is moving its offices from the fourteenth to the sixteenth floor of 15 Park Row, New York, where double the former space is available. The machine shop at Newark, N. J., was largely increased a few months ago.

* * *

GENERAL AMERICAN TANK CAR CORP., Chicago, has established a repair shop in yards of the Nickel Plate railroad at Madison, Ill., opposite St. Louis. It will be used for the repair of tank cars of this company and others and has capacity for about 150 cars per month.

* * *

MA. HOFFT CO., Indianapolis, has built three stokers for the Ford Motor Co., for use on its rubber plantation in Brazil. They will be shipped to Fordson, Mich., and thence by the Ford steamers to South America. This brings the number of stokers furnished by the Hofft company to the Ford interests to 15.

* * *

WR. VOORHEES & CO., San Francisco and Seattle, have been made representatives of the Billings & Spencer Co., Hartford, Conn., in Montana, Colorado, Wyoming, Idaho, Utah, Nevada, Washington, Oregon, California, Arizona, New Mexico and El Paso, Tex.

* * *

RACINE SCREW WORKS, Racine, Wis., whose plant was destroyed by fire in February, is being reorganized and will rebuild, the location not yet being determined. Jerome J. Ritter has disposed of his entire interest. Albert O. Falkenrath, president, will retain his office in the new company and will devote his entire time to the company.

* * *

BROWN INSTRUMENT CO., Philadelphia, has moved its Pacific coast branch to larger quarters at 420 Westinghouse Electric building, 420 South San Pedro street, Los Angeles. Stanley F. Godfrey is manager.

* * *

ARCADE MALLEABLE IRON CO., Worcester, Mass., has elected officers as follows: President and general manager, Henry P. Blumenauer; vice president, William E. Dunham; treasurer, Robert J. Nelson; directors, John P. Tinsely, J. Verner Critchley, F. A. Drury, Henry P. Blumenauer, William E. Dunham of Worcester; Bowen Tufts, C. E. Stevens, Joseph B. Hoyt, E. L. Bennett, Arnold Whittaker and George A. Perry of Boston.

* * *

GUNITE CORP., Rockford, Ill., has been formed to take over the manufacture of a gun iron alloy formerly produced by the gunite division of the Rockford Malleable Iron Works. Duncan P. Forbes is president and John A. Forbes secretary and treasurer of the new corporation. The alloy is a strong, rigid, wear-resisting cast metal, being used for various machine parts, locomotive wearing parts and automotive parts.

* * *

GEORGE J. MEYER MFG. CO., Milwaukee, manufacturer of bottling machinery, has bought the buildings and land of the former Power & Mining Machinery Co., at Cudahy, Wis., a suburb, from the Worthington Pump & Machinery Corp. The plant has been idle about four years. Allis-Chalmers Mfg. Co., Milwaukee, bought the equipment two years ago.

* * *

BLISS & LAUGHLIN INC. Harvey, Ill., producer of cold finished bars and shafting, announces the purchase of the plant and property of Hotchkiss, Blue & Co. Ltd., Harvey. The property consists of about five acres, two acres of which are improved with plant buildings. It is understood that Bliss & Laughlin Inc. purchased the property to provide for future expansion as the acquisition permits a straight-line plant extension with sufficient acreage to take care of the

company's requirements for many years. It is probable that the first of the contemplated plant additions will be completed during the present year, with further additions as needed.

* * *

LEIPZIG TRADE FAIR has opened American headquarters at 11 West Forty-second street, New York.

* * *

TRICO FUSE MFG. CO., Milwaukee, has moved its office at Pittsburgh into larger quarters at 405 Penn avenue. William A. Bittner is in charge.

* * *

DETROIT SEAMLESS TUBES CO., Detroit, has re-elected officers and retiring directors for the coming year.

* * *

BUTLER MFG. CO., Cleveland, manufacturer of mechanical sweeping devices, will move its office and factory to Akron, O., June 1.

* * *

ARTHUR L. STEVENS CORP., engineer, Chicago, will move its offices May 1 from 28 East Jackson boulevard to the Engineering building, 205 West Wacker drive.

* * *

NORTH SIDE FOUNDRY, West Collins street, Columbus, O., has been bought by F. P. Johness, 1019 Neil avenue, and has started production of gray iron castings.

* * *

WAGNER ELECTRIC CORP., St. Louis, has moved its city branch sales office from 50 Church street to 30 Church street, suite 1110. The service station remains at 321 West Fifty-fourth street.

* * *

RUST ENGINEERING CO., Rust Construction Co. and Bolivar Clay Products Co., Pittsburgh, have removed their offices to the American Bank building, Sixth avenue and Grant street.

* * *

EMPIRE STEEL CORP., Mansfield, O., announces the opening of its new western district offices at 1838 South Fifty-fourth avenue, Cicero, Ill., Chicago suburb. F. W. Beach will be western district manager. Associated with him will be H. W. Angsten and L. E. Cunnick.

* * *

LAKE CARRIERS ASSOCIATION, Cleveland, has re-elected its officers, as follows: President, J. S. Ashley; vice president, L. C. Sabin; general counsel, Newton D. Baker; secretary-treasurer, George A. Marr. Use of pulverized coal as a matter of economy and efficiency in operation was considered at the annual meeting at Cleveland, April 19, Carl J. Jefferson, head of the fuel conservation section, leading the discussion. He described experimental work being done in the field.

* * *

COLUMBUS McKINNON CHAIN CO., Tonawanda, N. Y., has acquired control of the hoist division of the Chisholm-Moore Mfg. Co., Cleveland. Factory, sales office and personnel will remain unchanged. S. H. Moore, for 30 years active with the Chisholm-Moore company, will remain with the organization.

* * *

MANITOBA ROLLING MILLS CO., Selkirk, Man., a subsidiary of the Manitoba Bridge & Iron Works Ltd., Winnipeg, Man., has bought a plant at Redcliff Alta., which it will rehabilitate and put into production shortly. An open-hearth furnace will be built and meanwhile ingots will be shipped from the Selkirk plant.

* * *

METAL EQUIPMENT CO., Cleveland, has started the manufacture of dust arrestors and sand blast rooms. The latter are being fabricated for the New Haven Sand Blast Co., New Haven, Conn. The company's regular line includes dust collectors, safety guards, heating and ventilating equipment.

* * *

WELDING APPLIANCE CO., 2111 West Lake street, Chicago, has been organized and will be incorporated at once. It will take over the manufacture and sale of the Lewis seam welding head. George S. Lewis, vice president and general manager of the Mead Cycle Co., Chicago, is owner and proprietor of the Welding Appliance Co.

* * *

WATERLOO MFG. CO., Waterloo, Ont., manufacturer of agricultural implements, has been bought by James Playfair, Midland, and E. J. Pallet, Galt, Ont. Plants will be expanded. The company has been in existence for 40 years. It has branches at Portage la Prairie, Regina, Saskatoon and Calgary.

* * *

PIONEER IRON WORKS, Second and Chancellor street, Philadelphia, has been sold to Paul J. Gramigna, ship chandler, through Samuel T. Freeman & Co. auctioneers. Joseph R. Williams, former president of Pioneer Iron Works, has established a new organization under the name of Pioneer Marine Repairs, with main offices at Naudain and Hancock streets, Philadelphia.

* * *

WELLMAN - SEAVER - MORGAN CO., Cleveland, has appointed several sales distributors for its recently developed line of gate and globe valves. These are designed for high pressures and temperatures in steam plants, oil refineries and other industrial uses. The new distributors are: Acme Well Supply Co., 136 Liberty street, New York; Basil S. Burgess, coal Exchange building, Huntingon, W. Va.; Eastern Steam Specialty Co., 270 Lafayette street, New York; Walter G. Heacock, Detroit; Steam Equipment Mfg. Co., Pittsburgh; R. George Ward, 809 Harrison building, Philadelphia.

* * *

CENTRAL PUBLIC SERVICE CORP., Rockford, Ill., has awarded a contract to the Koppers Construction Co., Pittsburgh, for 21 Becker type by-product coke ovens with capacity of about 3,500,000 cubic feet of gas per day. Two Koppers gas producers, a by-product plant with equipment for the production of ammonium sulphate, and a coal and coke handling plant are included.

* * *

BRIDGEPORT IRON WORKS, Norristown, Pa., recently formed, has bought a tract on which it will build a plant. W. R. Browne is president of the new company and with him are associated a number of persons connected with the former Gehret Bros., whose business has been disposed of at receiver's sale. The plant will be 95 x 200 feet, with offices in a separate structure. Ornamental and structural iron and steel work will be manufactured.

* * *

MARLATT BATTERY MFG. CO., Danville, Ill., manufacturer of automobile and radio batteries, has been incorporated under the same name to provide capital for adding to its production facilities. It has started production of power units for radio. It will require generators, boilers and battery charging equipment in its addition. Hugh J. Marlatt is president, J. O. Marlatt vice president, and Charles E. Marlatt secretary and treasurer.

* * *

WESTERN STEEL PRODUCTS CO. LTD., Winnipeg, Man., manufacturer of fireproof windows and doors, in which American and British capital was largely interested, is now under Canadian control. It has been bought by R. Russell Symington, vice president and managing director, and associates. The company is the result of several mergers of western Canadian firms and has plants at Edmonton, Calgary, Saskatoon, Vancouver and Toronto. Additions to several plants are planned. Mr. Symington will continue in charge of the executive department.

Obituaries

GEORGE W. NIEDRINGHAUS, 63, chairman of the National Enameling & Stamping Co., and the Granite City Steel Co., both of Granite City, Ill., died at St. Louis, April 19. Mr. Niedringhaus was made treasurer of the St. Louis Stamping Co. in 1884, and after it was absorbed by the National Enameling & Stamping Co. in 1899 he became plant manager at Granite City. In 1908 he was made manager of steel mills and in 1919 he was elected president of the company. Later he was elected chairman. Mr. Niedringhaus became chairman of the Granite City Steel Co. in 1927. He had been connected with other organizations in and around Granite City, including the St. Louis Coke & Iron Co., now the St. Louis Gas & Coke Corp., of which he was a vice president.

* * *

Harry C. Sanford, 59, who died at his home at Englewood, N. J., April 22, was engaged as chief engineer on various subway construction contracts in New York for many years.

* * *

John M. Glenn, 68, for 30 years secretary of the Illinois Manufacturers' association, Chicago, died April 22 at Hot Springs, Ark. He was born in Ft. Wayne, Ind., and received his education at Monmouth college, Monmouth, Ill.

* * *

James Alfred Skinner, long identified with the General Electric Co., Schenectady, N. Y., died at East Orange, N. J., April 15. He was supervisor of industrial relations and the manager's representative on the co-operative committee for General Electric during the war.

* * *

John Challoner, 72, president and treasurer of the Wilkin-Challoner Co., Oshkosh, Wis., manufacturer of woodworking machinery, died April 18. The original business was founded by his father, the late George Challoner, in 1860 at Omro, Wis., and was moved to Oshkosh in 1887.

* * *

William R. Quinn, Pacific coast representative of the Combustion Engineering Corp., New York, died in that city April 12. Mr. Quinn, a resident of San Francisco, was president of the Quinn Oil Burner & Torch Co. when it was purchased by the Combustion corporation in 1922. He then became manager of the fuel oil burning equipment department of the Combustion corporation and later was made Pacific coast representative.

* * *

William F. Lane, 58, superintendent of the Girard, Pa., plant of A. M. Byers Co., Pittsburgh, died April 21. He was born in Warren, O., and became connected with the Byers company in 1909, after spending much time in various mills and shops in that district.

* * *

Harry H. Chase, 54, Jamestown, N. Y., retired manufacturer, died April 15. For several years he had been connected with the Art Metal Construction Co. and the Auto Registering Machine Corp. At the time of his retirement two years ago he was general manager of the Handle Lock Wrench Co. of Jamestown.

* * *

Elias Elkan Ries, 65, said to have discovered the alternating electric current system of generation, transmission and conversion, and holder of 200 patents, died in New York April 20. His patents on his inventions in electrical railroading were purchased by the Westinghouse Electric & Mfg. Co. in 1903.

* * *

Louis Frederick Lyne, 80, one of the founders of the American Society of Mechanical Engineers and the first editor of *American Machinist*, died in Jersey City, N. J., April 16. At the time of his death he was chief engineer for Colgate & Co. Mr. Lyne was born in Clinton, Conn. Early in 1890 he was mechanical superintendent of the Lackawanna railroad shops in Jersey City.

* * *

James J. Wood, 72, Fort Wayne, Ind., engineer, inventor and holder of 240 patents for electrical and mechanical devices, died April 20 at Asheville, N. C. His early connections were with the Branford Lock Co., Branford, Conn., and the Brady Mfg. Co., Brooklyn, N. Y. From 1880 to 1885 he was a partner in the Fuller-Wood Co. and thereafter for more than 40 years was associated as inventor and consulting engineer with the Thomson-Houston and General Electric companies. He was a fellow of the American Institute of Electrical Engineers.

Men of Industry

(*Concluded from Page* 1105)

the welder service division in the Cleveland district.

J. R. Rothermel has been placed in charge of welder service in Chicago, and W. Weaver has been placed in charge of consumer motor sales in the same district.

* * *

Howard E. Robinson, assistant general manager of sales of the Newton Steel Co., Youngstown, O., is recovering from an operation for appendicitis.

* * *

J. H. McAlarney has resigned as assistant to the president of the United States Steel Products Co., New York, to become president of the Tulsa Rolling Mill Co., Tulsa, Okla.

* * *

Nelson G. Craig has been appointed district sales manager at Philadelphia for the Oliver Iron & Steel Corp., Pittsburgh. He was formerly affiliated with the Rumsey Electric Co., Philadelphia.

* * *

R. E. Watson has been elected treasurer of the Wisconsin Wire Works, Appleton, Wis., succeeding John J. Sherman, whose death was announced in IRON TRADE REVIEW, issue of April 12.

* * *

W. E. Brewster has been elected superintendent of the blast furnace department of the Wisconsin Steel Co., South Chicago, Ill., subsidiary of the International Harvester Co., succeeding Henry Phelps Howland, whose death was announced in IRON TRADE REVIEW, issue of March 8.

* * *

Mr. Lloyd Loftus, recently connected with the Koppers Co., Pittsburgh, has become associated with Arthur G. McKee & Co., Cleveland, engineers and contractors. Mr. Loftus will be resident engineer at Duluth, in connection with the design and construction of dock, coke plant, etc., for the Zenith Furnace Co.

* * *

Arthur R. Adelberg, formerly district sales manager at Philadelphia for the Cyclops Steel Co., Titusville, Pa., and the Universal Steel Co., Bridgeville, Pa., has become associated with the Duraloy Co., Pittsburgh, with headquarters at the company's eastern sales offices, 136 Liberty street, New York.

British Steel Demand Expands

Shipbuilders and Railroad Equipment Manufacturers Place Larger Orders—Purchases of Mill Machinery Heavier—Consumption of Scrap Increasing—Buying of Continental Steel Light—Plan for Wire Rod Syndicate Postponed

European Headquarters,
IRON TRADE REVIEW,
Caxton House, Westminster, S. W.1

LONDON, April 24.—British iron and steel business is expanding steadily, at home and abroad. Consumption of steel scrap is increasing. Shipbuilders are placing larger orders for plates. Makers of railroad tires and axles are booked ahead for three months. Excellent demand is noted for special motor steels. Orders from South Wales for mill machinery show improvement. British users are buying very little continental steel. Pig iron demand is slow, but stocks are nearly exhausted and the trade is expecting a more attractive situation to develop soon.

Reports from Brussels say demand in the Belgian markets is slackening, and prices have receded slightly. French mills have good backlogs. The German market is dull. Formation of an international wire rod syndicate has been postponed until the end of the year.

British Steel Trade Shows Growing Activity

Office of IRON TRADE REVIEW,
Prince's Chambers, Corporation St.

BIRMINGHAM, Eng., April 13.—(*European Staff Service*)—The best evidence of the general activity of the steel trade is the fact that at most works a restart was made Tuesday after only one day's stoppage. The exceptions were works in which repairs were necessary or where it is customary to take stock at this period. Mills have good prospects of expansion and demand for structural steel is substantial. In the shipbuilding areas good contracts have been made for ship plates. Next to shipbuilding come the railroads, the Sheffield mills in particular having excellent orders for tires and axles with the prospect of several weeks' work to occupy the mills' attention.

Sterling $4.88

Continued high price of Continental steel is having a marked effect on British order books. Rerolling mills which for a long time have found it profitable to rely mainly on foreign billets are now almost invariably using British material. It is likely that the overseas returns will soon show marked reductions in imports. Foreign billets delivered into this district cost £5 12s 6d ($27.45) and naturally British material at £5 15s ($28.06) is preferred. Large importers have definitely warned Continental steelmakers that no more business need be looked for from this side the Channel, until prices are reduced. A few foreign blooms have been bought at £5 2s ($24.88).

After a long run of activity the rail mill at Barrow is idle, and a restart is not yet in sight. Welsh mills, however, are busier than for a long time, largely because of the extent to which British semifinished material has replaced foreign. Welsh tin plate works were large buyers of foreign steel when these carried substantial economies as compared with British, but that period has obviously passed, and some Welsh works have several months' work on hand. There are indications, too, that English steel is now almost invariably preferred for building.

The pig iron situation has changed

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, April 23	*British* Gross Tons U. K. Ports		*French* Metric Tons Channel Ports		*Belgium and Luxemburg* Metric Tons Channel Ports		*German* Metric Tons Rotterdam or North Sea Port	
Export Prices f. o. b. Ship at Port of Dispatch—By Cable		£ s d		£ s d		£ s d		£ s d
PIG IRON								
Foundry No. 3, Silicon 2.50-3.00	$16.10	3 6 0*	$15.62	3 4 0	$15.62	3 4 0	$15.62	3 4 0
Basic	.....	.....	14.64	3 0 0	14.64	3 0 0	15.37	3 3 0
Basic-bessemer	17.08	3 10 0†	14.64	3 0 0	14.64	3 0 0	14.64	3 0 0
Hematite, Phosphorus 0.02-0.05	17.08	3 10 0	22.16	562.5*	.....	.....	17.08	3 10 0
SEMIFINISHED STEEL								
Billets	$28.06	5 15 0	$22.33	4 11 6	$22.33	4 11 6	$22.20	4 11 0
Wire rods	47.58	9 15 0	28.06	5 15 0	28.06	5 15 0	28.06	5 15 0
FINISHED STEEL								
Standard rails	$37.82	7 15 0	$31.11	6 7 6	$31.11	6 7 6	$31.11	6 7 6
Merchant bars	1.58c	7 5 0	1.16c	5 5 0	1.16c	5 5 0	1.16c	5 5 0
Structural shapes	1.61c	7 7 6	1.02c	4 12 6	1.02c	4 12 6	1.06c	4 16 0
Plates, ship, bridge and tank	1.77c	8 2 6	1.36c	6 4 0	1.36c	6 4 0	1.49c	6 15 0
Sheets, black, 24 gage	2.40c	11 0 0	2.31c	10 10 0	2.31c	10 10 0	2.18c	9 18 0
Sheets, galvanized, 24 gage, corrugated	2.86c	13 5 0	3.30c	15 0 0	3.25c	14 15 0	2.92c	13 5 0
Bands and strips	2.29c	10 10 0	1.32c	6 0 0	1.32c	6 0 0	1.18c	5 7 0
Plain wire, base	2.12c	9 15 0	1.54c	7 0 0	1.54c	7 0 0	1.60c	7 5 0
Galvanized wire, base	2.94c	13 10 0	1.98c	9 0 0	1.98c	9 0 0	2.04c	9 5 0
Wire nails, base	2.51c	11 10 0	1.62c	7 7 6	1.62c	7 7 6	1.87c	8 10 0
Tin plate, base box 108 pounds	$ 4.45	0 18 3	.....	.....	.....	.....	$ 6.83	1 8 0

*Francs

Domestic Prices at Works or Furnace—Last Reported			Francs		Francs		Marks	
Foundry No. 3 Pig Iron, Silicon 2.50—3.00	$16.10	3 6 0	$17.53	445(2)	$16.32	585	$18.65	78
Basic pig iron	.....	.....	18.91	480(1)	14.93	535	21.04	88
Furnace coke	2.93	0 12 0	5.91	150	5.16	185	5.14	21.50
Billets	28.06	5 15 0	21.87	555	23.72	850	27.97	117
Standard rails	1.74c	8 0 0	1.36c	755	1.43c	1,100	1.51c	140
Merchant bars	1.63c	7 10 0	1.22c	676	1.22c	935	1.48c	137
Shapes	1.72c	7 17 6	1.17c	650	1.17c	900	1.45c	134
Plates, ship, bridge and tank	1.88c	8 12 6‡	1.42c	790	1.43c	1,100	1.65c	153
Sheets, black, 24 gage	2.51c	11 10 0	2.74c	1,520	2.41c	1,850	2.38c	220
Sheets, galvanized 24 gage, corrugated	2.89c	13 5 0	3.42c	1,900	3.80c	2,925	3.78c	350
Plain wire	2.12c	9 15 0	1.71c	950	1.89c	1,450	2.32c	215
Bands and Strips	2.29c	10 10 0	1.42c	790	1.54c	1,185	1.71c	158

*Middlesbrough; †Scotch foundry iron; ‡delivered; (1) Basic-bessemer; (2) Longwy. British export furnace coke £0 12s 0d ($2.93) f. o. b. Ferromanganese £20 10s 0d ($100.04) delivered Atlantic seaboard, duty paid. German ferromanganese £15 0s 0d ($73.20) f. o. b.

The equivalent prices in American currency are in dollars per ton for pig iron, coke, semifinished steel and rails; finished steel is quoted in cents per pound and tin plate in dollars per box. British quotations are for basic open-hearth steel; French, Belgian, Luxemburg, and German are for basic-bessemer steel.

definitely for the better. Comparative dullness of the first quarter has been reflected in the selling average for No. 3 Middlesbrough of £3 3s ($15.36) which carries a trifling reduction to the blast furnace men, but the market is now firm at £3 6s ($16.10) and Pease & Partners of Skinningrove have found it possible to start an additional blast furnace, bringing the total for the district to 38. Stocks are trifling and are rapidly being absorbed.

The position is not quite so good in the Barrow area where the output of the ten furnaces operating is not completely absorbed, but demand from Scotland and the Midlands makes up for the somewhat poor business done with the Barrow steelworks. The moderate price, however, is expected to improve the demand and some foreign business is hoped for. Ferromanganese continues at £13 10s ($65.88) to the home buyer with a small concession down to £13 5s ($64.66) for export. For hematite in the Northeastern district the demand is rather poor, and stocks are heavy. Little of this iron has lately been sent to tme Midlands.

Prior to the Birmingham quarterly meeting makers of best iron reduced their price from £12 10s ($61.00) to £12 ($58.56). This was partly to adjust the relationship with medium qualities which have not been so firm as marked bars. There is a fairly confident feeling that this will prove the last reduction for a long time to come, and that future movements will be upward. The merits of best wrought iron are well recognized and much of this material has been bought for shipbuilding and engineering purposes. The restart after the holidays is made with good order books and excellent prospects of activity.

Revival of business in the tin plate trade has brought good orders to Staffordshire foundries for rolls and mill furniture generally. The outlook of the foundries has much improved.

The galvanized sheet trade shows a better tone, with improving orders from India, especially Bombay and Calcutta. A number of these are for prompt shipment. Prices still range between £12 2s 6d ($64.05) and £13 5s ($64.66). For black sheets some encouraging business has come from the Far East. The tin plate trade maintains the decided improvement shown in recent months. Such stoppage as has taken place this week is explained by the fact that under the compulsory restriction of output many mill owners have chosen this week as a suitable time for closing down, but in many cases mills have run through the holidays without a stop. Prices are causing some anxiety, the general feeling being that the present selling figure is too low, having regard to the rising price of semifinished steel and the prospects of higher costs in other directions. Inquiries from overseas continue satisfactory.

In the west of Scotland the galvanized sheet trade shows decided improvement, but the business in black sheets is rather quiet, especially for thicker gages.

French Steelmakers Well Booked

Office of IRON TRADE REVIEW.
9 Rue de Londres

PARIS, April 13.—(*European Staff Service*)—Easter time usually is a quiet period for industry, as many firms close for some days, but this year it was even quieter, since the approach of the general elections adds its restricting action to the seasonal influence.

Metallurgical works have to fulfill important commitments and most of them are well booked for several weeks with orders at high prices. The first three months of 1928 will prove quite satisfactory, as prices were beneficial and the output of the various works was heavy. This situation, therefore, is not uniform, and the position of some transforming industries is critical. Competition among these manufacturers is serious and prices are low. It is easy to realize under what difficult conditions they work. The heavy industries have formed powerful sales organizations that prevent competition and fix prices, whereas foundries and wire products industries have been unable to organize themselves in the same way. As usual, they pay for their mistakes and are actually losing much money.

Competition is keen between mines, and new prices for domestic coal have not prevented it. The pig iron market is calm and buying is slackening as foundry operators think that the tendency is toward lower prices, due to English competition. It was indeed noticed this week that some tonnages of English pig iron were sold on the Atlantic seaboard at French home prices. Merchant bars are not as firm as they were a month ago and price reductions are necessary to get new orders.

However, many of the large orders for finished products that have been booked since the beginning of the year allow the works to be firm on their quotations. It now is possible to find some semifinished products, as some works are buyers.

Bars are quoted at 670 to 690 francs per metric ton. Prices of semifinished material and beams are those quoted by the comptoir. Ingots are 470 francs, blooms 525 francs, billets 565 francs, all f.o.b. Thionville. Plates are sold at 830 to 850 francs, and the lighter gages at 1050 to 1150 francs. The price for wire rod remains at 790 francs.

German Steel Market Less Active

BERLIN, April 12.—(*European Staff Service*)—An interesting deal has taken place between the United Steel Works Corp. and the firm of Krupp. The United Steel Works Corp. has sold to Krupp its 50 per cent participation in the Ehscher-Lippe coal mine and its participation of 43 per cent in the Norddeutsche Hutte. It is stated that the transaction has been completed and that the price paid by Krupp is 30,000,000 marks ($7,175,000) in cash. The quota of the United Steel Works Corp. in the coal syndicate prior to this deal was 25,500,000 tons, and as the annual output of the Emscher-Lippe coal mine is about 1,100,000 tons, the reduction in the tonnage of coal at the disposal of the concern is comparatively small, while it increases Krupp's quota from 10,300,000 to 11,400,000 tons. Krupp already was the owner of the other half-control of the mine. It is stated that the price paid some years ago by the United Steel Works Corp. for acquiring its participation in the mine was 21,000,000 marks, so that a good profit has been made. In its annual report the management of the United Steel Works Corp. states the volume of orders from railroads has been disappointing, and a blast furnace of about 40,000 tons annual capacity recently has been blown out owing to insufficient railroad orders.

There appears to be a decline of domestic demand. In the constructional department demand is somewhat restricted, owing partly to shortage of capital which prevents the acception of building schemes. However, the German loan council has approved the floating of 100,000,000 marks ($23,920,000) worth of mortgage bonds for housing purposes, and a still larger amount is expected shortly to be approved, to be contracted by various municipalities. Lessened demand for steel at present is somewhat unexpected, as at this time of year a revival usually is experienced. It is noted, however, that more buying recently has been done as consumers expected a rise in prices, and stocks in the hands of merchants and consumers are considerable. Negotiation between sheetmakers, sheets being the only rolled product not yet syndicated, are being continued under favorable conditions.

In view of the slight restriction of domestic buying, German producers again are turning their attention to export business. Exports of iron and steel products in February were 390,776 metric tons, compared with 363,026 tons in January. On the other hand, imports decreased from 265,392 tons in January to 240,324 tons in February. Export prices again are following a downward trend owing to concessions made by French and Belgian competitors on world markets.

Urge Gear Makers To Do Research Work

(*Concluded from Page* 1073)

of the instrument and to show how it is possible to determine the proper moment for quenching as the specimen passes through its cycle of expansion and contraction in the critical temperature ranges.

Over 1000 industrial research laboratories employing over 10,000 trained research workers are in existence in the United States, according to C. E. Skinner, assistant director of engineering, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., who addressed the Friday morning session on the subject of 'The Value of Research to the Present Day Manufacturer." No accurate statistics are available as to the annual expenditure for industrial research, but it is said to run into many millions of dollars with a number of individual laboratories having budgets of a million dollars or more.

Concluding, the speaker said that research intelligently directed and applied is of value to the manufacturer, in fact, is essential to his existence. The purpose of research was summarized as follows: To cure trouble; to anticipate and prevent trouble; to improve the quality of materials or products; to develop new processes, materials or products; to develop new uses for existing products; to effect savings; to abate nuisances; to develop new products to meet an existing market or to create new markets; to assist in standardization; to aid in perfecting new materials or devices; to develop better customer and public relations; and to add to human knowledge. Replying to a question, Mr. Skinner said he believed a manufacturer was justified in spending up to 10 per cent of his gross income in research.

On Friday afternoon over 100 of those attending the convention were guests of the Gleason Works at a complimentary luncheon. Following this the party was conducted through the modern plant which manufactures gear cutting and gear quenching machinery. Several newly designed machines attracted attention.

Numerous committee reports were made at the various sessions. For the most part, the reports merely indicated progress, although in a few instances slight revisions were suggested to recommended practices. One of the important reports was that of bevel gear and nomenclature committees which co-operated in submitting a suggested standard for future design for bevel gear nomenclature. The standard was adopted and a tribute paid to efficient efforts of the committees. The nomenclature committee now is working on a nomenclature for herringbone gears. Ultimately, when nomenclature for all types of gears has been completed, all will be assembled into one volume comprising an encyclopedia.

The keyway committee recommended a slight revision of practice for keyways for gears. The nonmetallic gearing committee submitted a practice on "preferred pitches" for nonmetallic gearing. Data sheets showing horsepower ratings for laminated phenolic or rawhide spur pinions based on recommended practice were offered. The spur gear committee is carrying on an extensive investigation as to the horsepower of steel pinions and later will submit tables for approval. Inasmuch as an attempt to standardize backlash for automobile transmission gears failed in support from the Society of Automotive Engineers, this committee was authoribed to make no attempt to establish such a standard.

The metallurgical committee submitted for discussion a review of recomended practice for forged and rolled alloy steels. No definite action could be taken for after approval it will be submitted to subcommittee No. 8 of the sectional committee on gears. The differential and transmission committee reported that its work has gone as far as possible without overlapping the work of the S. A. E., but it is prepared to carry on if later developments permit. Reporting for the research committee, Earle Buckingham discussed briefly two tests now being made on gears at the Massachusetts Institute of Technology. One of these tests just completed developed some interesting tooth failures.

New Directors Are Elected

At a business session on Friday morning the following directors were re-elected: E. W. Miller, chief engineer, Fellows Gear Shaper Co., Springfield, Vt.; and E. J. Frost, president, Frost Gear & Forge Co., Jackson, Mich.; and the following new directors were chosen: F. B. Drake, president and general manager, Johnson Gear Co., Berkeley, Calif.; and P. L. Tenney, chief engineer, Muncie Products division of General Motors Corp., Muncie, Ind. W. G. Jones, president, W. A. Jones Foundry & Machine Co., Chicago, was selected to fill the unexpired directorship of F. W. Sinram, president, Gears & Forgings Inc., Cleveland, who resigned recently. By action of the membership, Mr. Sinram, honorary president of the association for life, was made an exofficio member of the board.

Pittsburgh Industries in Safety Conference

That the human element always be taken into consideration in any and all safety programs was the keynote of all three sessions of Pittsburg's fifth annual safety engineering conference, held April 19, under the auspices of the Western Pennsylvania Safety Council. About 250 delegates, representing companies employing approximately 350,000 workmen, were present. The program concluded with a dinner meeting at the Fort Pitt hotel in the evening.

In all of the gatherings there was an undertone of appreciation of the employer's responsibility not alone to install adequate and efficient safety devices but to educate the workmen to acquire a safety complex; to think, talk and act safety at all times to the end that it shall be second nature to attend to their own safety and the safety of their fellow workmen. By so doing, employers can demonstrate to their employes their own sincerity of purpose and their own belief in the safety first idea and thus inculcate the same sincerity and belief on the part of the workmen.

"While many accidents formerly taking place in steel mills, such as explosions and spills of molten metal, are now a thing of the past, hand, foot and leg accidents still prevail," said J. A. Oartel, chief, safety bureau, Carnegie Steel Co., Pittsburgh, in discussing "Hand and Foot Accidents." He stated that the installation of safety devices of course must precede everything else but that the effort cannot and must not stop there, since the human element calls for personal carefulness in ever increasing measure. In the discussion which followed, G. H. McClain, safety engineer of the Jones & Laughlin Steel Corp., Pittsburgh, said that hand and foot accidents afforded them their greatest problem in accident prevention.

S. F. McKee, assistant to general manager, Pressed Steel Car Co., Pittsburgh, stressed the fact that accident prevention is largely a matter of education. He said that 75 per cent of the results achieved to date at his plant are through education, the remaining 25 per cent through safeguards, mechanical devices, etc.

J. A. Northwood, safety engineer, Cambria works, Bethlehem Steel Co., Johnstown, Pa., stated that less than 3 per cent of the accidents in the plant have to do with the condition of the plant itself, that it is the men themselves to which the major portion of attention must be directed in cutting down accidents.

Machinery

Orders Continue at High Rate and Buyers Press for Deliveries Which Are Becoming More Extended—Crane Sales Improve

DESPITE an absence of large buying, sales of machine tools and shop equipment are at a high rate. Demand is extremely well scattered and the volume of small orders comprises a handsome total. While automobile manufacturers are not buying extensively, parts makers are taking equipment, particularly those which have received contracts from the Ford Motor Co. Deliveries on machines are lengthening and buyers are pressing for shipment. Manufacturers have orders on their books which insure steady operations through May, but there is some uncertainty as to what is to come after that. Two large orders for material handling equipment have been placed during the last week, one for 116 crane and 116 hoists and the other for 7000 feet of monorail.

New York, April 24.—Brisk trading continues in the eastern machine tool market. With few exceptions no outstanding lists are reported, but the volume of small orders is large. Some leading sellers expect this month to exceed March in point of business and assert that at present they see no let up in sight. A leading buyer is Otis Elevator Co., which has been closing on equipment for its various plants. It is understood that within the past two weeks this company has purchased 20 machines for Canada alone and five for shipment to Europe. Further substantial purchases are expected to be made, particularly in view of the expansion program at Harrison, N. J., Two exceptionally large orders feature the conveying equipment market. One involves 116 underhung cranes and 116 electric hoists, both cranes and hoists of 1000 pounds capacity each, and 5000 feet of track for five plants of American Steel & Wire Co. The other calls for 7000 feet of monorail, 100 switches and 60 drop sections for Mergenthaler Linotype Co., Brooklyn, N. Y. General Electric Co. has issued an inquiry for 10 or 12 machines for its service plant in Pittsburgh, the list including four engine lathes, one arbor press, one milling machine and one drill. The inquiry is said to be a forerunner of similar lists for other service shops of General Electric Co. Wright Areonautical Corp., Paterson, N. J., has started work on a $3,500,000 expansion program. Within the past week it has purchased eight or ten machines, including grinders and automatic screw machines, and is likely to be a further heavy buyer over the next few months. Fairchild Airplane Mfg. Corp., Farmdale, Long Island, has eight or ten machines under active contemplation for installation in its new plant. New York Central railroad has closed on several machine tools within the past few days.

Pittsburgh, April 24.—Inquiries for equipment give dealers and manufacturers' representatives plenty of material to work upon, but buyers are slow to reach the closing stage. For some sellers April is falling down to the January level of business, the smallest month of the first quarter. A fair number of single tools have been ordered this week by various manufacturers, and a foundry in northern Pennsylvania bought two large heavy-duty motor-driven grinders. It may possibly purchase five more before its program of expansion is completed. Westinghouse Electric & Mfg. Co. has started upon its list, having bought two small items from a large machinery supply house. More will be bought this week. American Rolling Mill Co. is piecing out its furnace equipment at Butler, Pa.

Chicago, April 24.—Inquiry for machine tools continues slow and shows a considerable tapering off from March. Fairly active industrial buying is reported in Chicago and Milwaukee territory, this being represented largely in single-item orders. Inquiry from the western railroads fails to develop as expected. The Rock Island has put out an inquiry for four floor grinders, a duplex abrasive wheel grinder, a 2½-inch universal turret screw machine and a 20-inch and an 18-inch engine lathe. It is indicated that the Santa Fe will begin active purchasing against its list shortly, as revised bids are going in. That road already has purchased some of its welding equipment. Placing of the Santa Fe order this month should bring the April total of business to a good level in this territory. Union Pacific will take bids in the West for three small lathes and some punch equipment. Burlington is inquiring for several items and has placed a flue welder. Nash Motors Co. has purchased some automatic press equipment for its Kenosha, Wis., plant.

Cleveland, April 24.—Dealers seem well pleased with the business that is being placed on the books. Not only is the demand general, but automobile parts manufacturers are taking much equipment. This applies particularly to those given contracts by the Ford Motor Co. In some cases the need is urgent, and efforts are being made to speed deliveries whereever possible. Inasmuch as the greater part of the equipment is of special nature, as contrasted with general purpose units, deliveries are slowing up. Used equipment is moving well and dealers' floors are becoming somewhat depleted.

CRANE ORDERS PLACED

116 underhung cranes and 116 electric hoists, both cranes and hoists of 1000 pounds capacity each, and 5000 feet of monorail track for installation in plants of American Steel & Wire Co., at Worcester, Mass., and in Pittsburgh district; to Reading Chain & Block Corp.

Twenty-five ½-ton 2-motor hoists for Campbell Soup Co., Camden, N. J.; previously noted as placed, reliably reported to have gone to Shepard Electric Crane & Hoist Co.

Five 20-ton locomotive cranes for Boston & Maine railroad; to Link-Belt Co.

Four 2-ton cranes for National Radiator Corp., Johnstown, Pa.; to Reading Chain & Block Corp.

Two 8-ton electric overhead traveling cranes for Textile Machinery plant of Leiberknecht Inc., Reading, Pa.; order just shipped by the Reading Chain & Block Corp.

Two 5-ton cranes for Koppers Co., Pittsburgh, for shipment to Philadelphia and Brooklyn, N. Y.; to Cleveland Crane & Engineering Co.

Among single orders were: 7½-ton truck crane for Atwell, Gustin & Morris, New York, to Browning Crane Corp.; 15-ton crawler crane for Day & Zimmerman, Philadelphia, to Browning Crane Corp.; 20-ton 5-motor overhead crane for Black & Clawson, Hamilton, O., to Niles Crane Corp.; 5-ton electric crane for Missouri Rolling Mills Corp., St. Louis, to Niles Crane Corp.; 7½-ton truck crane for Pattelli & Wilson, general contractors, New York, to Orton Crane & Shovel Co.; 7000 feet of monorail track, 100 switches and 60 drop sections for Mergenthaler Linotype Co., Brooklyn, N. Y., to G. P. Morse, New York, the equipment to be furnished by tramrail division of Cleveland Crane & Engineering Co.; steam crawler shovel for Henry Steers Inc., New York, to Marion Steam Shovel Co.

Two 10-ton gantry cranes for manufacturer in Pittsburgh district; bids being taken.

Two cranes for scrap yard in Youngstown, O., territory; bids being taken.

100-ton 4-motor crane for waterside tie plant of New York Edison Co. to be erected in East Fortieth street, New York; inquiry revived through Thomas E. Murray, 55 Duane street, New York, engineer.

Overhead crane for American Smelting & Refining Co., New York, for shipment to Monterey, Mex.; bids asked.

Columbus McKinnon Buys Chisholm-Moore

Columbus McKinnon Chain Co. Tonawanda, N. Y., has purchased the chain block electric hoist and crane divisions of the Chisholm & Moore Co., Cleveland. Sam H. Moore, founder and president of the Chisholm & Moore company, continues active and the personnel of the company will be unchanged. Sales offices and plant will remain in Cleveland, to be known as the Chisholm-Moore Hoist Co., a division of the Columbus McKinnon Chain Co. A new corporation, the Chisholm-Moore Malleable Iron Co., has been organized to take over the foundry division of the Chisholm & Moore company.

Frank Dow, acting commissioner of customs, Washington, has ruled that stamped steel shapes imported into the United States should have duty assessed on them at the rate of 40 per cent under paragraph 399 of the tariff act.

CONSTRUCTION and ENTERPRISE

Concise Timely Business Building Opportunities from Field of Industry

North Atlantic

BALTIMORE—General Elevator Co., Bush & Ridgely streets, plans to build a 1-story plant addition, 20 x 140 feet. W. S. Austin, Maryland Trust building, is consulting engineer.

ARLINGTON, MASS.—R. W. Shattuck & Co. Inc. has been incorporated with $20,000 capital to manufacture and deal in iron, steel, manganese, copper, etc., by Charles H. Stevens, 29 Devereaux street, Arlington.

BOSTON—H. A. Banash & Son Inc. has been incorporated with $50,000 capital to do roofing, sheet metal and light iron work by I. James Banash, 8 Nazing street.

BOSTON—Baber Co. has been incorporated with $100,000 capital to manufacture and deal in tools, machinery and other mechanical de..ces by C. E. Whitney, 50 Federal street.

BOSTON—Testa & Scurto Engineering Co. Inc. has been incorporated with $90,000 capital to manufacture and deal in machinery and implements for the building business, by Ralph Testa, 224 Hanover street, Boston.

BOSTON—L. L. Rowe Co., 74 Portland street, has been incorporated with $80,000 capital to manufacture and deal in all kinds of appliances and devices by Richard C. Ashenden, 95 Fair Oaks avenue, Newton, Mass.

CAMDEN, N. J.—S. M. Langston Co., Sixth and Jefferson streets, manufacturer of paper box machinery, has awarded the contract for a 1-story plant 40 x 95 feet.

CAMDEN, N. J.—John R. Geisinger Co. has been incorporated with 30,000 shares no par value stock to engage in the iron and steel foundry business, by J. S. Gradwell, Camden, attorney.

HARRISON, N. J.—Otis Elevator Co. has awarded the contract for structural steel for its new plant to Shoemaker Bridge Co.

IRVINGTON, N. J.—Forstner Chain Corp., 646 Nye avenue, manufacturer of metal novelties, wrist chains, etc., has awarded the contract for a 3-story plant addition, to W. J. MacEvoy Construction Co., 85 Academy street, Newark.

JERSEY CITY, N. J.—Hygrolit Inc. has been incorporated with 1000 shares no par value stock to manufacture and deal in textile machinery by Corporation Trust Co., Jersey City.

NEWARK, N. J.—Mattern Wheel & Rim Co. has been incorporated with $25,000 capital by Peterson, Steiner & Kohan, New York, attorneys.

NEWARK, N. J.—Metered Machine Co. has been incorporated with $50,000 capital to manufacture and deal in washing machines by Howard Rice, Newark, attorney.

NEWARK, N. J.—Roepke Pan Machine Corp., 161 Ogden street, manufacturer of machinery, plans to build a 1-story plant, 125 x 125 feet, at Newton Falls, O.

PATERSON N. J.—John Nordmeyer, 260 Tenth avenue, plans to build a 1-story machine shop.

PATERSON, N. J.—Wright Aeronautical Corp. will expand its plant facilities to include a 4-story building adjoining the plant in Lewis street, and a 1-story assembly plant. The expansion will increase the output of airplane engines.

BROOKLYN, N. Y.—Hinsdale Iron Works Inc., 1058 Rockaway avenue, will build a 1-story plant addition, 60 x 100 feet.

BROOKLYN, N. Y.—Bedford Nickel Plating & Mfg. Co. has been incorporated with $10,000 capital by J. P. Morris, 26 Court street, attorney.

BROOKLYN, N. Y.—Roche Surgical Co. has been incorporated with $10,000 capital to manufacture and deal in surgical instruments by G. H. Boyce, 16 Court street, attorney.

BUFFALO—Marr Bronze Foundry has been incorporated with $5000 capital by S. L. Fitzpatrick, Buffalo, attorney.

BUFFALO—Trico Products Co., 624 Ellicott street, manufacturer of automobile accessories, has awarded the general contract for a new plant to J. W. Cowper Co., Fidelity building. (Noted April 12.)

NEW YORK—New York Central railroad has closed on steel for an extension to its Van Nest shops.

NEW YORK—American Smelting & Refining Co., with headquarters here, is figuring on steel for a plant building in Monterey, Mex.

NEW YORK—Phoenix Utility Co., 61 Broadway, is inquiring for steel for a power plant to be erected at Waterville, N. C.

NEW YORK—New York Edison Co. has awarded the contract for structural steel for its waterside station to Hedden Iron Construction Co.

NEW YORK—Erie railroad will install much new machinery for its contemplated expansion and shop improvement at various division points.

NEW YORK,—New Jersey Zinc Co., 160 Front street, has started construction of its plant addition, near Palmerton, Pa., for production of metal slabs.

NEW YORK—B. L. W. Engineering Corp. has been incorporated with $10,000 capital to manufacture and deal in gear machinery by W. J. Lamey, 50 Broadway, attorney.

NEW YORK—Gerenty Sheet Metal Works has been incorporated with 200 shares no par value stock by D. Sorger, 551 Fifth avenue, attorney.

NEW YORK—Vernon Roofing & Sheet Metal Works has been incorporated with $10,000 capital by I. Weitz, 67 West Forty-fourth street, attorney.

NEW YORK—Electric Steam Pressing Iron Corp. has been incorporated with $5000 in preferred shares and 1250 shares no par value stock, by H. Levis, 1225 Broadway, attorney.

NEW YORK—Novelty Inventions Corp. has been incorporated with 100 shares no par value stock to manufacture and deal in machinery and metal work by Schechter & Lotsch, 12 East Forty-first street, attorneys.

NEW YORK—Otis Elevator Co., Eleventh avenue and Twenty-sixth street, has awarded the contract for a work shop to be built at 605

Resale Equipment News

Sales Calendar

May 3—Property of American Refining Co., Wichita Falls, Tex., at receiver's sale.

May 23—Machinery and equipment of Ohio Body & Blower Co., Cleveland, to be sold at auction in piecemeal lots.

MACHINERY and equipment of the Ohio Body & Blower Co., Cleveland, will be sold at auction May 23, by Industrial Plants Corp. The property will be sold in piecemeal lots. The concern formerly made closed bodies for Locomobile, Jordan, Gardner, Moon and Stearns automobiles. Almost all equipment is motor driven.

* * *

REAL estate of the Bennington Scale Mfg. Co., Bennington, Vt., has been sold under execution. The sale included land, shops and foundry. The equipment of the plant had been disposed of about two years ago.

* * *

MACHINERY, equipment and stock of the Commercial Truck Co., Philadelphia, was sold at receiver's sale April 25 and 26 by Samuel T. Freeman & Co., auctioneers. The sale included goodwill and parts, jigs, dies, patterns, patents drawings, machine tools, small tools supplies.

First street, Harrison, N. J., to J. Stewart & Co., 17 East Forty-second street, New York.

POUGKEEPSIE, N. Y.—Bids are being taken through the state architect's office, Flat Iron building, New York, on contracts for a power plant here.

ROCHESTER, N. Y.—Rochester Wire Fence Co. has been incorporated with $10,000 capital by J. F. Thomas, Rochester, attorney.

SCHENECTADY, N. Y.—Sunset Toy Mfg. Corp. has been incorporated with $20,000 capital by W. M. Nicoll, Schenectady, attorney.

CORRY, PA.—Penn Electric Light Co. plans to build a new substation on West Washington street, to replace the present station which will be razed.

ERIE, PA.—Sterling Aluminum Co., 2640 Cherry street, is building an addition to its plant to take care of increasing business.

MEADVILLE, PA.—A new coal and ash-handling plant will be constructed by the Erie railroad at its yards here, in addition to track and yard extensions and improvements.

NORRISTOWN, PA.—Bridgeport Iron Works, incorporated recently, has awarded the contract for a new plant, 95 x 200 feet, to Friend & Reiff, Norristown. The company will produce structural and ornamental iron and steel work in addition to the manufacture of fire escapes. W. G. Browne, Powell street, is president of the company.

PHILADELPHIA—Philadelphia Electric Co. has awarded the contract for structural steel for a station to Belmont Iron Works.

PHILADELPHIA—Domenick Leberi & Son, 1137 South Bend street, plan to build a new 1 and 2-story iron works, 60 x 110 feet and 20 x 60 feet.

PHILADELPHIA—Nice Ball Bearing Co. will start work at once on an addition in Henry street, north of Hunting Park avenue. W. R. Sauter is engineer in charge. (Noted March 15.)

PHILADELPHIA—Philadelphia Rapid Transit Co., 810 Dauphin street, will build a 1-story motor bus repair shop, 282 x 400 feet, to include a machine shop, overhauling and reconditioning department, etc.

PHILADELPHIA—Contract for a plant for the England Walton Co. Inc., Vine street west of Third street, has been awarded to William Steel & Sons Co., 124 North Fifteenth street. The proposed structure will be seven stories, of concrete construction.

PAWTUCKET, R. I.—Collyer Insulated Wire Co., 249 North Main street, soon will award the contract for a 3-story plant, 80 x 105 feet, to be built on North Main street.

CHAMPAIGN, ILL.—Caldwell Mfg. Co. Inc., 1002 North Market street, has been incorporated with $25,000 capital to manufacture and deal in metals and metal products, etc., by C. M. Caldwell, Harriet Caldwell and Vincent Manning.

CHICAGO—Miehle Printing Press & Mfg. Co., Fourteenth and Robey streets, W. V. Kelly president, plans to build a plant addition.

CHICAGO—Federal Electric Co., 8700 South State street, manufacturer of electric signs, etc., contemplates building a new branch plant at Dallas, Tex.

CHICAGO—Illinois Copper & Iron Co., 217 Maplewood street, has plans prepared for a 1-story plant, 48 x 100 feet, with a rear addition 32 x 72 feet.

CHICAGO—Highways Resurfacing Co., 29 South LaSalle street, has been incorporated with $10,000 capital to manufacture and deal in machinery, by Samuel and Louis Dulsky.

CHICAGO—Luminator Inc., 849 West Washington boulevard, has been incorporated with $1000 capital to manufacture and deal in lighting and illuminating devices, by LeRoy Weis and Samuel A. Litman.

CHICAGO—Anchor Ventilating & Sheet Metal Works, 11 South LaSalle street, has been incorporated with $10,000 capital to manufacture and deal in sheet metal works of all kinds by M. M. Skome, E. M. Herman and H. J. Sitron.

CHICAGO—Franklin Adjustable Stool Co., 2512 West Monroe street, has been incorporated with $1500 capital to manufacture and deal in mechanical devices, by Benjamin F. Forsyth, Olfield Nicholls and P. F. Koch.

CHICAGO—Darmstadter Heater Corp., 327 South LaSalle street, has been incorporated with 100 shares no par value stock to manufacture and deal in heating apparatus and appliances, by Maurice Darmstadter, N. W. Skipworth and G. L. Emrich.

CHICAGO—Airco Lubricator Co., 4640 Superior street, has been incorporated with 250 shares no par value stock to manufacture and deal in castings, implements, machines, etc., by George M. Sundheim, John E. O'Hara and Arthur W. Sprague.

CHICAGO—Baltimore Electric Sign Co., 2649 North Kildare avenue, has been incorporated with 2000 shares no par value stock to manufacture and deal in electric signs and equipment by E. C. Guthard, William H. Odium and Louis W. Reinecker Jr.

CHICAGO—Heat Devices Specialties Inc., 709 South Robey street, has been incorporated with 50 shares no par value stock to manufacture and deal in mechanical equipment, controls and devices, by James Lally, Roy Page and L. E. Hinton.

EAST ST. LOUIS, ILL.—Federal Iron & Foundry Co., Thirteenth and Brady streets, has been incorporated with $25,000 capital to manufacture and construct ornamental, structural and architectural iron work, by H. W. Becker, Peter Morton and J. H. Gersche.

HARVEY, ILL.—Bliss & Laughlin Inc., manufacturer of cold finished steel, etc., has purchased the plant and property of Hotchkiss, Blue & Co., also of Harvey, to provide for future expansion.

MOLINE, ILL.—John Deere Harvester Co., 504 Third avenue, will build a foundry at Third avenue and Thirteenth street.

MOLINE, ILL.—Harrington Seaberg Corp., 1708 Third avenue, manufacturer of signal devices, has awarded the general contract to Axel Carlson Co., 506 Fifteenth street, for a 4-story plant, 62 x 150 feet. S. Seaberg is president.

BRAZIL, IND.—Eaglesfield-Link Co., manufacturer of woodworking machinery, plans to build a plant. The company was incorporated recently. (Noted April 12.)

INDIANAPOLIS—Nelson T. Stover Mfg. Co. has been incorporated with $10,000 capital to manufacture and deal in machinery, by Nelson T. Stover, Otto P. Epler and Harry A. Glathart.

KENDALLVILLE, IND.—Electric & Mfg. Co., manufacturer of automatic electric water heaters, plans to build a new plant.

KENDALLVILLE, IND.—City of Kendallville, W. A. DeBault clerk, plans to build a power plant addition. Froelich & Emory, Toledo Trust building, Toledo, O., are engineers.

MT. VERNON, IND.—John Staples, proprietor of the Staples Foundry, is adding a molding room, 35 x 38 feet, to take care of increasing business.

ADRIAN, MICH.—Line-O-Scribe Inc., manufacturer of a window card-writing machine, contemplates negotiating for additional plant space to take care of increased business.

DETROIT—Zima Sign Co., 9117 Joseph Campau avenue, is inquiring for machinery and equipment, including sheet metal brake, shear for cutting angle irons, punch and socket punch, etc., for the manufacture of electric signs.

DETROIT—General Motors Corp., General Motors building, plans to build a 7-story research laboratory 210 x 230 feet, on Second boulevard. Plans also are being prepared for 1 and 2-story plant additions to its automobile plant at Saginaw, Mich., including pattern shop, foundry, cleaning building, etc.

FLINT, MICH.—A. C. Spark Plug Co. will soon award the contract for a 3-story plant addition for the porcelain department. Wright & Nice, 4339 South Saginaw street, are architects.

LANSING, MICH.—Durant Motors Inc. has awarded the contract for its plant extension to be built here to H. C. Christman & Co., Detroit. The plant is expected to be in full operation Aug. 1.

CLEVELAND—Erie railroad will remodel its East Fifty-fifth street roundhouse and coach yard.

CLEVELAND—Graham-Paige Co. of Ohio, 2020 Euclid avenue, plans building a new service station on Carnegie avenue near Fortieth street.

CLEVELAND—Plans are being prepared for the plant to be erected by the Triplex Screw Co., 6112 Central avenue. The building will be located at 5319 Grand avenue on the company's own property. It is expected to be completed by July 1.

DAYTON, O.—Dayton Power & Light Co. has completed plans for a new auxiliary steam plant to be built on Eaker street, between Perry and Longworth streets. The site has been purchased and work has started on razing the property.

FREMONT, O.—Schaaf Razor Blade Co. has been incorporated with $25,000 capital by Paul E. Schaaf, Mae M. Schaaf and Chester A. Gilbert.

GALION, O.—American Steel Abrasives Co., maker of steel grit and shot, will double its present plant capacity with a 2-story addition- 40 x 80 feet.

IRONTON, O.—Ironton Mfg. Co., manufac-

turer of metal roofing, etc., contemplates building a plant addition on newly acquired property.

MARION, O.—Commercial Steel Casting Co. has begun work on an addition to its main building, to be 60 x 120 feet, when completed. The contract for the work has been let to the Bellefontaine Bridge & Iron Co. The addition is expected to increase the capacity 20 per cent.

YOUNGSTOWN, O.—The sand drying plant of the Portage Silica Sand Co. was damaged by fire April 15.

CHARLESTON, W. VA.—Linde Air Products Corp. has awarded the contract for its new plant to Stone & Webster.

MAYVILLE, WIS.—Work has been started by Edward Boehmer on a garage and repair-shop of brick and steel construction. The Immel Construction Co., Dana building, Fond du Lac, Wis., is handling the general contract.

OSHKOSH, WIS.—The Frost Boiler Co., Chicago, is low bidder for furnishing three 150-horsepower marine boilers for the new power plant of the state normal school here.

SUPERIOR, WIS.—A new screening unit will be added to the local docks of the Great Lakes Coal & Dock Co., Minneapolis. Plans are being drawn by Roland C. Buck, Superior, engineer.

UNION GROVE, WIS.—The village has voted to buy the local water works plant from private ownership and plans improvements and enlargements this year. Harold E. Moe is village clerk.

WAUPUN, WIS.—James Davision is building a 2-story garage and service building, 64 x 125 feet.

West Central

CEDAR RAPIDS, IOWA—Contract for a 1-story garage and service station, 93 x 120 feet and 40 x 47 feet has been awarded by W. King, 98 First avenue, west.

CEDAR RAPIDS, IOWA—Authority has been granted to the Iowa Railway & Light Corp., by the state executive council, to construct a dam and hydroelectric plant on the Cedar river near Rochester, Iowa. Isaac B. Smith is president, and Sutherland Dows is general manager.

PETERSON, IOWA—Northwestern Light & Power Co. will install a new 600-horsepower diesel engine and make other improvements to electric light plant. A. C. Sloss is manager.

WATERLOO, IOWA—Rath Packing Co. has awarded the general contract to H. A. Maine Construction Co., 304 Marsh-Place building, for a 1-story boiler house addition, 43 x 56 feet. A burner and crusher for pulverizing fuel will be installed. J. W. Rath is president.

BENSON, MINN.—A new municipal power plant and distribution system including installation of a 600-kilowatt bleeder turbine plant is contemplated. Arthur L. Mullergren, 555 Gates building, Kansas City, Mo., is the engineer. S. A. Berg is city clerk.

DULUTH—Western Steel Products Co., New Duluth, has awarded a contract to the Smith Construction Co., 311 Builders' Exchange building, for an addition to plant and erection of a dipping tank.

MINNEAPOLIS—Berge Bros. Mfg. Co. has been incorporated with $50,000 capital by Alfred D., Oscar W., Herman F., and Henry I. Berg, to manufacture metal products including radiator furniture.

KANSAS CITY, MO.—Hicks Stove & Mfg. Co. has been incorporated by Daisy Hicks, Charles R. Boydson and Fred C. Immele.

KANSAS CITY, MO.—Pague Mfg. Co., Twenty-ninth street and Southwest boulevard, F. L. Woodward manager, contemplates building a plant addition for the manufacture of cans.

ST. LOUIS,—Colonial Steel Co., 928 Main street, has awarded the general contract for a 1-story storage and distributing plant to W. C. Harting Construction Co., International Life building.

ST. LOUIS—Usona Mfg. Co., 3512 Chouteau avenue, manufacturer and dealer in bronze iron and wire work, has awarded the contract for a 1-story plant addition 70 x 80 feet to Gillespie & Daly, International Life building. (Noted April 12.)

OMAHA, NEBR.—Paxton-Mitchell Co., 2614 Martha street, has awarded the contract to the Austin Co., Cleveland, for a 1-story iron foundry, 92 x 162 feet, at Twenty-seventh and Martha street. James L. Paxton is president. (Noted Feb. 23.)

MINOT, N. D.—Northern States Power Co. will remodel and enlarge pump house and electric light and power plant.

Western States

BELL, CALIF.—Brainard Metal Products Co. Inc., 4801 Everett place, recently moved here, will fabricate tubing and manufacture metal bed ends, hospital equipment, etc.

LOS ANGELES—Dahlstrom Metallic Door Co., 3350 East avenue, has awarded the general contract for a 1-story plant addition to William P. Neil Co., 4814 Loma Vista avenue.

LOS ANGELES—Willys-Overland Co., 2141 Colorado Eagle Rock, manufacturer of automobiles, plans to build an assembly plant on Randolph street. Austin Co. of California, 777 East Washington street, is engineer.

SAN DIEGO, CALIF.—Southern California Iron & Steel Co. plans plant improvements throughout the coming year.

SAN FRANCISCO—Johns-Manville Co. Inc. of California, 159 New Montgomery street, manufacturer of asbestos products, roofing, etc., plans to build two 1-story plants 100 x 500 feet, at Pittsburg, Calif.

SAN JOSE, CALIF.—A. Pratt, care of Wolfe & Higgins, Realty building, architects, soon will award the contract for a 1 and 2-story machine shop. (Noted April 5.)

SANTA CLARA, CALIF.—Pacific Mfg. Co., manufacturer of sash, contemplates building a new plant. Hamm, Grant & Bruner Inc., 607 Ferguson building, Los Angeles, are engineers.

DENVER—Alexander Industries Inc., J. Don Alexander president, suffered fire loss to its paint shop, airplane plant, April 20.

SACO, MONT.—Great Northern railroad, Railroad building, St. Paul, has awarded a contract to A. Guthrie & Co., 1209 Builders' Exchange building, St. Paul, for building 70 miles of railroad extension from Saco to Tunnel.

MARSHFIELD, OREG.—Mountain States Power Co. will make improvements and extensions of light and power service in the Coos Bay division.

PORTLAND, OREG.—Pure Iron Culvert & Mfg. Co., 763 Gladstone avenue, has completed construction work on its new plant and will engage in the manufacture of ingot iron culvert pipe. (Noted Feb. 23.)

SEATTLE—Pacific Car & Foundry Co has awarded the structural steel contract for work in its plant to the Pacific Coast Steel Co.

SEATTLE—Ewart Engine Co. has been incorporated with $100,000 capital by W. E. Ewart, Eric Johnson, Alfred Bornstein and E. A. Hartley.

SPOKANE—Hofius-Ferris Equipment Co., manufacturer of mechanical equipment, plans to build a new plant to include one unit, 1-story, 90 x 175 feet with a machine shop, 35 x 80 feet.

WENATCHEE, WASH.—W. T. Butler, Seattle, has been given the general contract for construction of a locomotive repair shop, 100 x 200 feet, 54 feet high, of structural steel and brick walls to be erected for the Great Northern railroad. (Noted April 12.)

Canada

INGERSOLL, ONT.—Ingersoll Machine Co. has started work on an addition to its plant to be 40 x 110 feet, for which machinery and tools will be purchased.

LEAMINGTON, ONT.—Bids are being received by R. M. Selkirk, clerk, until April 30, for waterworks equipment including, furnishing and installing with all necessary connections, two centrifugal pumps, each having a capacity of 1200 imperial gallons per minute against a head of 125 feet, and cross connected, together with all necessary motors, starters, etc. Also furnishing f.o.b. Leamington, one 6 x 10-inch Venturi tube meter with recording chart, indi-

cating dial and totalizing register. J. J. Newman is town engineer.

LONDON, ONT.—Taylor Electric Co., 526 Adelaide street, will build plant addition here. Building to be 1-story, 70 x 150 feet, brick construction. Watt & Blackwell, Bank of Toronto building, are architects.

LONDON, ONT.—London Air Transport Ltd. has been incorporated to manufacture and deal in airplanes, airships, flying machines, etc., with $800,000 capital by Thomas A. Terry, Albert M. Judd and Charles N. Judd.

OTTAWA, ONT.—Chat Falls Power Co. plans installation of a hydroelectric power development plant on the Ottawa river. Plans in this connection have been filed with the department of public works, Ottawa.

TORONTO, Ont.—Century Motors Sales Ltd. has been incorporated to manufacture and deal in automobiles, trucks, taxicabs, etc., with $40,000 capital by Alexander D. McKenzie, William A. McRae and Frank W. Day.

TORONTO, ONT.—Menzies Tire Co. Ltd. has been incorporated to manufacture and deal in automobiles, motors, engines, machines, etc., with $40,000 capital by Russell P. Locke, Newton J. Powell and James E. Mumford.

TORONTO, ONT.—Rotaprint Co. of Canada Ltd. has been incorporated to manufacture and deal in office equipment and supplies, machines and machinery equipment with $40,000 capital by John M. Macintosh, Frederick W. Scott and Hugh A. Macintosh.

TORONTO, ONT.—Service Stations Ltd., which recently took over the plant of John Woods on Coxwell avenue, has secured an additional site of 2½ acres adjoining its works and proposes to build a large addition. The company will manufacture gasoline pumps, air compressors, automatic lifts, storage equipment, etc.

WINDSOR, ONT.—Chrysler Corp. of Canada Ltd. has awarded general contract to the Border Construction Co. and the steel work contract to the Trussed Concrete Steel Co. of Canada Ltd., for the erection of an addition to its plant here. Pennington & Boyd are architects.

How Aluminum and Its Alloys Are Welded on Commercial Basis

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metal of the same composition as the casting. However, in the case of a complicated casting where severe contraction strains are liable to ensue, 5 per cent silicon rod would be better.

A flux should be used when welding aluminum castings just the same as for sheet aluminum, however, there is no objection to puddling also. Puddling will merely break up the oxide film and leave it incorporated in the weld metal, thus weakening the weld.

As soon as the weld is finished and the work has had time to cool it should be thoroughly washed to remove all traces of flux. If the flux is permitted to remain on the weld it will cause corrosion. Therefore it is important to be sure that every trace of flux is removed, particularly if the completed job is to be painted. Merely cleaning by means of hot water and a scrubbing brush is not sufficient or thorough enough to remove the flux that may be in crevices or cracks which are not readily attacked by a brushing operation. A more effective method of removing the flux is by means of a steam jet. When a final sand blasting operation is used, the steam jet should be used both before and after sand blasting. A still more efficacious scheme for removing the flux is to wash in a hot 2 per cent nitric acid solution. In general, the flux removal may be efficiently performed by first thoroughly soaking the welded article in a "first wash" tank of hot water for about three minutes, during which soaking period the welded joint should be thoroughly scrubbed with a brush to insure the removal of the bulk of the flux. The article is then dipped in the acid tank for from three to five minutes, after which it is again dipped in the first wash tank and then thoroughly rinsed in a "final rinse" tank of hot water. The washed articles, if small, may be dried in sawdust.

Welds in aluminum are quite often untouched after completion, especially in the case of thin metal, where the weld should be so even that it is not unsightly. When desirable, the weld can be made completely invisible by grinding off the excess metal and polishing the whole.

The factors which have been discussed are the ones which, if not properly controlled or handled, offer the greatest potential difficulties in welding aluminum. However, the welding of aluminum, and excellent welding too, is not a really difficult process.

New Trade Publications

REFRACTORY LINING—General Refractories Co., Philadelphia, has issued a bulletin calling attention to performance of its high alumina brick refractory in a number of installations.

RIVETERS—A buiietin on riveters is being circulated by the Hanna Engineering Works, Chicago. Illustrations show various types of riveters for varying work in the field and shop.

ALLOY STEEL CASTINGS—Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa., has issued a pictorial folder illustrating industrial use of its high strength cast steel, with test figures.

OIL BURNER—A circular on its type of oil burner has been issued by the Johnston Mfg. Co., Minneapolis. Full atomizing is claimed, through the mixing action of the air. It is illustrated.

CONVEYORS—Alvey Mfg. Co., St. Louis, is circulating a bulletin on its various types of conveyors for a wide variety of industrial uses. It is illustrated to indicate how it may be put to use in many plants.

MILLING MACHINES—Kearney & Trecker Corp., Milwaukee, is mailing a folder containing a reproduction of a letter from a user of one of its milling machines, describing an unexpected degree if accuracy. Comment on this performance accompanies the letter.

FLAT TURRET LATHE—Jones & Lamson Machine Co., Springfield, Vt., in a current bulletin shows numerous closeups of the operation of its flat turret lathe on bar work. Time of the work is given to show possibilities of quantity production.

SCREW THREAD COMPARATOR—Jones & Lamson Machine Co., Springfield, Vt., is distributing a circular on its bench type of screw thread comparator. In addition to gaging screw threads the instrument may be used to gage other parts to insure accuracy of fit.

COMPRESSION TAMPER—An insert page for its catalog has been prepared by the International Steel Tie Co., Cleveland, covering its compression tamping machine. The device is used for compacting concrete under and about steel tie plates under the rails. It is illustrated.

PRECISION GAGES—Coats Machine Tool Co. Inc., 108 West Fortieth street, New York, agents for Fried. Krupp Aktiengesellschaft, Essen, Germany, is distributing a catalog of the various gages made by that company. It is illustrated to show the variety of uses to which the gages are applicable in machine work.

AIR COMPRESSORS—A bulletin on compressors and vacuum pumps has been prepared by Ingersoll-Rand Co., New York. It covers small and medium size machines. They are for use with air or gas, straight-line type, single-stage, two-stage or three-stage. The bulletin shows details of construction and furnishes engineering data. Illustration are ample.

STEEL DWELLINGS—Steel Frame House Co., Pittsburgh, has issued a booklet on steel framing for dwellings. The advantages of this material are described and typical dwellings are shown in architectural drawings. Various detail drawings illustrate methods of construction. The booklet is devoted to furthering the use of steel in place of timber.

COOLING FANS—B. F. Perkins & Son Inc., Holyoke, Mass., rely on many pictures and a minimum of text in telling the performance of their giant fans. They are designed to supply large quantities of cool air in heated weather to avoid the ill effects on workmen of excessive heat. The illustrations show a wide variety of uses.